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AND

IRON MANUFACTURER'S AND MINING GAZETTE.

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PRINCIPAL CONTENTS.

AMERICAN RAILROAD JOURNAL.

PUBLISHED AT 105 CHESTNUT ST. PHILADELPHIA.

Saturday, March 4, 1848.

To Contractors.—Hudson River Railroad.

The attention of Contractors is called to the following notice of the *Hudson River* Railroad Company, which we find in the Commercial Advertiser—the engineer having it advertently omitted to send it to this Journal, where all contractors look, *of course*, for *such* notices; and where they should, *of course*, *always* be first sent. We, however, make allowance for such omissions, knowing, of course, that they are inadvertencies. It is very opportune, however, to this number, as in it we commence the publication of the able report of the engineer upon the location of the road from Fishkill to Albany, and shall complete it next week.

HUDSON RIVER RAILROAD.—NOTICE for Proposals.—Sealed proposals will be received by the Directors of the Hudson River Railroad Company at their office, 54 Wall street, until the 15th day of March, for the Grading, Masonry, Piling and Bridging for that portion of said road which extends from Break Neck Hill to Poughkeepsie, a distance of about twenty miles. The work to be completed by the 1st day of April, 1849, according to the plans and specifications that will be submitted for examination as hereinafter mentioned. A reserve of 20 per cent. on the monthly estimates will be retained by the company until the contract is completed, as security for performance. No transfer of contracts will be recognised or permitted.

The maps and profiles of the line, the plans of work, the form of contract, and specifications of the manner of executing the same, will be ready for examination on and after the 10th of March, at the office of the Resident Engineer, Cold Spring, for that portion of the line between Break Neck Hill and Fishkill Landing: and at Poughkeepsie for the remainder of the line. On the 15th of March the maps, profiles and plans of work will be presented at the office of the company, 54 Wall street.

The line will be divided into convenient sections, and proposals may be made for one or all the sections; the party proposing, to state whether they desire all, and if not, what portion of the work they propose to enter into contract for.

The full names of all persons that are parties to a proposition, must be written out on the same.

The party to any proposition which may be accepted, will be required to enter into contract immediately after the acceptance of the same.

The Directors reserve to themselves the right to accept or reject proposals that may be offered, as they consider the interest of the company to require.

JOHN B. JERVIS, *Chief Engineer.*

Office of the Hudson River Railroad Co.
New York, 22d Feb., 1848. } 2t10

A Good Example, and Worthy of Imitation.

Though not an admirer of *imitation*, and *imitators* generally, yet there are *some* things which we should admire to see more frequently imitated in this country, as good would result thereby to others than to the *Railroad Journal*.

The particular example to which we now refer, and which we should like to see often imitated—was set by a gentleman in the west, having the management of a railroad, who in *December*, 1846, remitted *fifty* dollars in payment for the Railroad Journal, to be sent to his company, directors and himself, for the year 1847—and who has now imitated his own example, and remitted fifty dollars more, to pay for the same periodical for the same parties, up to Jan. 1, 1849! and we should belie our own feelings were we to refrain from saying that his liberality and his efforts are duly appreciated, as such acts and imitations are rare—yet we trust that this will not be "solitary and alone."

Pennsylvania State Railroads.

We are indebted to Wm. B. Foster, Jr., Esq., for a copy of the annual report, for 1847, of the superintendent of motive power and of repairs on the Portage (Pa.) railroad, which, together with that of the Columbia road, we shall give entire, that our readers may see the working of railroads under State management, as compared with those built and worked by companies.

Reading Railroad. Annual Report.

We have not yet received a copy of the annual report of this company.—Why not?

The *Boston Post* is in error in saying that "there were 97,800 tons of coal carried over the Philadelphia and Reading railroad during the week ending Feb. 24th, 1848." It should be since January 1st, including the week ending Feb. 24th.

Muscogee Railroad.

We learn by letters from Columbus, says the Macon Messenger, of 23d ult., that the eastern division of the above road, extending from Barnesville, to a point one mile beyond the Flint river, has been contracted for by Mr. John Gray, of this city, and a Mr. Timberlake, and that the work will be commenced at an early day. The act of the last Legislature authorised the Macon and Western company to endorse the bonds of the Muscogee company to the amount of $350,000. That endorsement has been authorised by the company to the amount of $250,000, provided the funds be applied to the construction of that part of the road east of the Flint. Under this guarantee, added to the private subscriptions, we see no reason why the work should not be rapidly pressed forward to completion.

Columbia Railroad Receipts.

Collector's Office, Philadelphia and Columbia railroad, March 1, 1848. The following shows the collections at this office:

Amount as per last report	$10,5 8 60	12,523 26	23,081 26
Do. month ending Feb. 29, 1848	$6,047 15	10,223 21	16,270 36
Whole am't since Nov. 30, 1847	$16,605 75	22,746 47	39,352 22
Same time last year			38,889 54
Increase			$462 68

Bangor and Waterville Railroad.

The estimated cost of the Bangor and Waterville railroad is $700,000. The result of the survey is said to be very favorable, and the company will speedily proceed with the work.

See Your Ticket, Sir?

The American practice of examining the tickets of passengers is not in use in England, but another, not uncommon here, seems to be also in occasional use there, as will be seen by the following item from the Chronicle: "We are glad," says the editor, "to observe a disposition on the part of companies to teach the public honesty, and check the practice of riding in superior carriages, when the fare for an inferior carriage has been paid. On the 11th January, Mr. R. Wright and Mr. R. Rhodes, of Wigan, and Mr. T. Johnson, of Pemberton, appeared before the magistrates, at the sessions in Manchester, each charged with attempting to defraud the London and North Western railway, by riding from Manchester

to Wigan, in a first class carriage, with second and third class tickets. The charge was pressed by the company principally on the ground that the offence is extremely difficult to detect, except by the adoption of regulations for inspecting all tickets at different places on the journey, which regulations would occasion considerable inconvenience and annoyance to the passengers generally; and therefore it was urged that the public are in reality equally interested with the company in the punishment of offences, of this character. The magistrates appeared to take the same view of the offence, and inflicted the full penalty allowed by the by-law under which the charge was made, viz: 40s. and costs against each of the defendants.

New York and Albany Railroad, Location from Fishkill to Albany.

After a thorough and critical examination of the line from Fishkill Landing to Albany, both on the margin of the river, and upon the table land, the following able report was made by Mr. John B. Jervis, the engineer, which places the subject before the public in a very clear light. In this, as in most other locations of important lines of communication, or public works, *local interest* makes a strong effort to bring it past its own door, losing sight of the principle which *ought* to govern in such cases—viz: the general convenience and the greatest good.

In this work it becomes a very important matter to obtain the best possible grades, as it will have in the Hudson river, the most powerful competition that it *could* have *except another equally well built railroad*; of this no one could be better aware than the able engineer who has charge of the work, and therefore he has endeavored, and with entire success, as we think, to show that the line on the margin of the river should be adopted in preference to the one on the table land, even though the latter would pass through, or nearer to, the centre of the principal villages.

We might call attention to particular parts of the report, as being entitled to particular attention, but no one commencing it will be content until he has read it through, therefore we give it entire without further comment.

OFFICE OF THE HUDSON RIVER R. R. Co.,
ENGINEER DEPARTMENT,
New York, 12th January, 1848.

To the Board of Directors of the Hudson River Railroad Company.

Gentlemen—I have the honor of presenting a report on the question of the location of the line of road from

FISHKILL TO GREENBUSH.

Examinations and surveys have been diligently prosecuted by Mr. Clark, the locating engineer, and he has submitted a detailed report with estimates on two routes. In preparing the lines for each route, surveys have necessarily been run over a great extent of country, in order to find the most favorable line for each. In the original survey of Mr. Morgan, the point of divergence from the river was at Fishkill, rising gradually, and as it approached Wappinger's creek it followed the eastern slope of the valley, passing near Houstonville, and crossing the creek east of the falls. The line then inclined westward, intersecting the old post road, and continuing near it until it reached the eastern part of Poughkeepsie. This line was found to be so unfavorable that a new point of divergence was taken at Wappinger's creek, and a route found which passed Poughkeepsie, about half way between the above line and the river, and intersected it about two miles north of Poughkeepsie. This portion of the line was found about one mile shorter, and much less expensive than the original or eastern line, and therefore it was decided to adopt it for this portion of the interior route. As the maps submitted herewith will show the line better than any written description, they are referred to for information on this point.

The river route generally follows along or near the shore of the river. At Poughkeepsie, Staatsburgh, and Barrytown, it passes back from the river, in order to avoid interfering with docks, at the first and last place, and a sharp bend in the river at the other. In these departures the grade rises from 20 to 30 feet above that on the immediate shore of the river. The grade at Albany was taken at 22 feet above low water in the river, and gradually declined, keeping above the influence of the freshets, until the point was reached where the freshets of the river do not raise the water above flood tides; from this point the usual level above the river was taken.

The comparative result of the estimates has been different from what was generally expected. After diligent surveys, the best line that could be found for the interior route from Fishkill to a short distance north of Staatsburgh, is so expensive as to have but little superiority over the river route.

From near Staatsburgh to Hudson, the general character of the interior route is highly favorable, offering a very easy line to grade, comparing very advantageously with the river line opposite. The line continues favorable from Hudson to about six miles north of Kinderhook village; but from this point to near Albany, it is of a very expensive character, so much so that it raises the estimate between Hudson and Albany about $100,000 above that of the river route on the corresponding section.

The main difficulties on the interior route, it will be seen, occur in ascending from the river to the table land. At the north end it passes a series of deep ravines and clay ridges. The table land could have been reached with a much less expensive line, if a grade of 30 feet to the mile had been adopted; but this was regarded as incompatible with the great object to be secured.

The following tables show the degree and amount of curvature and straight line on each route, and the inclination of the several lines, or gradients of the road, with the elevation and depression on each route:

SUMMARY OF CURVES AND STRAIGHT LINES.

River Route.

No. of curves.	Length of curve of same deflection, miles.	Radii in feet.	Deflection in degrees.	Total deflection
4	0·348	2062	41° 45'	
4	1·490	2475	191	
78	15·418	3094	1480 05	
1	0·664	3375	33	
7	1·533	3713	124 10	
30	6·716	4125	495 29	
10	2·976	4641	194	
5	1·093	5305	51 20	
14	2·363	6188	113 30	
1	0·184	7426	18	
7	1·850	9282	60 20	
				2802° 39'
Total curv'd line.	34·682			
" straight "	48·375			
Total length in miles.....	83 000			

SUMMARY OF CURVES AND STRAIGHT LINES.

Interior Route

No. of curves.	Length of curve of same deflection in miles.	Radii in feet.	Deflection in degrees.	Total deflection in degrees.
3	0·818	2062	116°	
5	0·184	2475	24	
34	8·578	3094	834 18'	
3	1·289	3713	105	
23	3·347	4125	252 36	
4	1·462	4641	95 20	
27	10·094	6188	528 15	
5	1·808	6188	528 15	
				2014° 29'
Total curv'd line.	27·580			
" straight "	54·885			
Total length in miles.....	82·465			

River Route.

Table of grades and level lines between Fishkill Landing and Greenbush.

Distance in miles.	Inclination per mile in feet, level.	Ascent in feet.	Decent in feet.	Total ascent & descent.
49 312				
9·204	0·271	2·50		2 50
5·993	0·500	3·00		2.00
1·759	1·136	2·00		2·00
2·454	2·445	6·00		6·00
1·000	5·00	5·00		5·00
2·250		22·50		
3·007			30.	
2·006		20·		
2·505 (12.774 miles.)	10·00		25.	127·50
1·503		15·		
1 503			15.	
0·504	15.	7 50		7·50
83·000		83·50	70.00	153·50

Interior Route.

Table of grades and level lines between Fishkill Landing and Greenbush.

Distance in miles.	Inclination per mile in feet.	Ascent in feet.	Decent in feet.	Total Ascent & descent.
8·888				
5·276	From 3 to 4	8·80	11	19·80
1·012	" 6 to 7		7	7
940	" 7 to 8		7·04	7·04
1·553	" 8 to 9	8·00	5	13·00
2·454	" 10	24·54		24·54
634	" 10 to 11		6·87	6.87
1·636	" 11		18	18
2·515	" 11 to 12	22 78	6	28·78
4 970	" 12 to 13	62·28		62·28
1·963	" 13 to 14		27	27
7·056	" 14 to 15		102·63	102·63
1·411	" 15 to 16	22		22
13·023	" 16 to 17	159·93	57·18	217·11
28·807	" 17	222 28	267·35	489·63
0·327	" 17·040	5·90		5·90
82·465		536·51	515·07	1051·58

From the tables of curves, which show the linear arrangement, it appears that the interior route has six and a half miles more straight line, and seven hundred and eighty-eight degrees less curvature, than the river route; the minimum and maximum radius being the same on each route. The length or distance from Fishkill Landing to Greenbush being on the

Interior route.....82·465 miles.
River route.....83·000 "

The river line is longest by..... 0·535 "

The line may be extended from half to three-fourths of a mile further north, depending upon the point that may be selected for a termination; but assuming it may be half a mile, the distances will be respectively on the

Interior route.....82·965 miles.
River route.....83·500 "

The tables of gradients, or planes, show the maximum grade of the river route to be 10 feet per mile, (excepting half a mile extending south from the Poughkeepsie depot, which has a grade 15 feet per mile; but as it occurs where the trains must stop, it is not regarded as of any practical importance.)

Interior route.....17 feet per mile.

The total rise and fall is on the

Interior route.....1051·58 feet.
River route..... 153·50 "

The highest summit above the river grade is

On the interior route.....218 feet.
On the river route..... 30 "

In linear arrangement the interior route is, say half a mile shorter, and has six and a half miles more of straight line. The curves on both lines, with a small exception, are on large radii, being from 3094 feet to 9282 feet, and admit of being traversed at high velocity. In this respect the lines may both be considered as good, the preference being with the interior, both as to directness and distance. In the more important matter of gradients, or planes of the road, the river route is materially superior.

No estimate has been made for land required for the road on either route. Experience having shown that the real value of land, when taken for such purposes, has little to do with the question, provided two things are settled, namely, the line of the road, and the determination to proceed with its construction.

In connection with this subject it may be remarked, that the land required for the interior route, for the greater part, passes through a fine agricultural country, and, to a greater or less extent, unavoidably traverses cultivated fields. The river line occupies mainly the rough and uneven ground along the shore of the river, doing little real damage, except as it disturbs buildings at the villages. In some places the wharves will require to be extended, and this is provided for in the estimates. To a very great extent the construction of the road will improve the appearance of the shore; rough points will be smoothed off, the irregular indentations of the bays be hidden, and a regularity and symmetry imparted to the outline of the shore; thus, by a combination of the works of nature and of art adding to the interest, grandeur, and beauty of the whole. However strongly this may now be objected to by some, it is confidently believed that before two years shall have passed after the completion of the road, none will be found willing to have the road removed.

To some extent, conditional contracts for land have been made on both routes, which will doubtless be submitted by the land committee, and the board will judge as to the influence of land damages on this question of location.

The estimated cost is as follows:—

River route,		
Grading, including masonry and bridging	$2,079,159	
Extending wharves	30,000	
Fencing	82,200	
	2,191,359	
Add for contingencies and superintendence at 10 per cent.	219,135	
		$2,410,494
Interior route,		
Grading, including masonry and bridging	$1,616,465	
Fencing	85,200	
	1,701,665	
Add for contingencies and superintendence at 10 per cent.	170,166	
		1,871,831
Interior less than river route		538,663

The estimate is made for grading for a double track to Poughkeepsie on both routes, and a single track from Poughkeepsie to Albany—the masonry and bridges for a double track throughout.

The estimate would not exceed the above on either route, more than $200,000, to provide for a double track throughout. The difference will be less in proportion to total cost on the river route, in consequence of the river walling, which is a heavy item, and will be the same for a single as for a double track.

Having presented a statement of the gradients of the two routes, it is now proposed to investigate their comparative advantages in the working of the road. In doing this, it will be the object to present the subject in a manner as free as practicable from technicalities, and if it do not appear clothed in a strict professional form, it is believed the board will not the less be able to understand and appreciate it. As the passenger and freight trade will be affected somewhat differently, it appears proper to consider them separately. In doing this, the engines and their power, and the resistance they must overcome, will be especially the subjects of discussion.

ENGINES FOR PASSENGER TRAINS.

The medium by which a locomotive exerts its power on the load, is the adhesion of what are termed its driving wheels, to the rails. If this adhesion be not sufficient, the wheels will slip on the rails, and though the engine may turn the wheels, the load will not move forward. In any event, therefore, provision must be made for so much adhesion in the driving wheels as will be sufficient to enable the engine to move with the load it is intended to transport. The capacity of the boiler to generate steam, determines the actual power of the engine. This power being settled, the load the engine can transport will be in a ratio varying inversely with the velocity with which it is to be moved; but the medium (adhesion) by which this power is transmitted will be in direct proportion, not to the velocity, but to the load.

This may be illustrated by supposing an engine capable of moving a load of 100 tons at the rate of 15 miles per hour. Now the velocity may be increased so that the engine can only carry 50 tons, though working up to her full capacity of generating steam; but the weight of the load being reduced one half, the amount of adhesion in the engine necessary to set it in motion is also reduced one half. The adhesion of the driving wheels, therefore, may be reduced as the velocity is increased, the power of the engine remaining the same.

It is important to keep distinctly in view, that the actual power of an engine determined by its capacity to generate steam, while the adhesion required to apply this power to the load, will be in proportion to the load, and the load will vary according to the velocity with which it is moved.

A passenger train is required to move more rapidly than a freight train, and, consequently, requires *less* adhesion in its driving wheels. The practical consideration of this question of adhesion depends materially on the character of the road and the circumstances of its passenger trade. If heavy gradients occur occasionally on the route, or heavy loads are to be carried, that do not require great speed, it is necessary to provide more adhesion to enable the engine to exert its power at a reduced velocity.

Passenger engines in this country are generally made with two pairs of driving wheels, a practice which I consider to have arisen from the frequency of heavy grades and the necessity of carrying heavy loads, at a corresponding diminution of velocity. This may do very well where no competition exists, and a moderate velocity will afford sufficient accommodation to control the trade; but it is not applicable where high velocity and the greatest economy are required in working the road.

The advantages of one pair of driving wheels over two pairs are—First; less number of working parts in the machine, by which the risk of accident and the cost of repairs are diminished. Second: The machine being more simple, works more effectively; and Third: By substituting a simple pair of bearing wheels for one pair of large driving wheels, from one and a half to two tons are saved in the weight of the engine, while its power is not reduced. These are considerations of great importance in an engine designed to run at high velocity.

In England it is believed to be the uniform practice, on roads on which a high velocity is maintained, to use engines with one pair of driving wheels, for their fast trains.

Perhaps there is no road that, from its gradient and the importance of running at high speed is better adapted to, or more urgently demands the use of engines with one pair of driving wheels for its passenger trade, than the one under consideration. The investigation will, therefore, proceed on the basis of engines with one pair of driving wheels, and they will be assumed to be capable of working up to their adhesion, at the speed with which it is intended to run.

The adhesion of a driving wheel will be in a ratio of the weight with which it bears upon the rail. This ratio will be affected by the condition of the rail. When dry, or washed by a heavy rain, the rail is regarded as in its best state for adhesion; and, when slightly wet by dew, or mist, in its least fa-

vorable state, if we except white frost and snow, which at times nearly destroy it. In a fair state of the rails, this adhesion is equal to 1 6 the insistent weight, and 1 8 is regarded as a safe basis for the usual, or ordinary condition of the rails. For a passenger business 1 10 is considered a proper ratio for general calculation; allowing for a larger range in the condition of the rails, and at the same time providing for the occasional occurrence of an extra load, which it may be necessary to attach to the engine.

The question has been dwelt on more at length, on account, not only of its importance, but because the views entertained are somewhat at variance with the general practice in this country.

Before proceeding to calculations of the load an engine will move, the principal sources of resistance will be briefly noticed. They are

First.—That arising from the friction of the cars. It is usually estimated that 8½ lbs. is a power sufficient to draw one ton of 2240 lbs. on a level. This has been reduced to 6 lbs. on the best carriages on English roads. It is probable that a similar reduction will in time be effected in this country, but as we must commence with cars, not differing materially from those now in use, it is best not to anticipate improvements, so far as to make them the basis of computation at this time. Eight and a half pounds, therefore, will be taken as the basis for friction.

Second.—Air offers a resistance that is very small at low velocities; but as velocity is increased, it becomes important. This is approximately determined, by ascertaining the area of that part of the train which is exposed, when in motion, to the impact of the air and the velocity of its motion. With a train of five passenger cars moving at the rate of 35 miles per hour, this resistance would require a power of about 400 lbs. to overcome it; and if, in addition to this, the train should meet a head wind, blowing at the rate of ten miles per hour, the resistance would be increased to about 660 lbs. Should such a current of wind, however, blow in the direction of the train's motion, the resistance would be reduced to about 200 pounds. It therefore appears, that while the train moves at the same rate, this resistance may be very different, varying according to the force and direction of the wind. The speed of the train, however, must be maintained in all cases, and power must be at command to meet the ordinary circumstances of this resistance. At the same time it would not be economical to provide at all times power sufficient to meet the resistance of extraordinary head winds—it would be best in such cases when a heavy train is to be moved, to use an extra engine. These remarks are sufficient to show the importance of this element of resistance, and such provision should be made for it as appears to be demanded for the proper conduct of a passenger train. A wind blowing at the rate of 10 miles per hour, is a very common occurrence, and as it must be against the train in one direction, it would hardly be prudent to provide less power than sufficient to meet this amount of atmospheric resistance.

Third.—The resistance from gravitation in ascending an inclined road, which will vary according to the angle of ascent. If the resistance from friction be taken at 8½ pounds per ton of 2240 lbs., the resistance from gravitation will be essentially the same in amount, in ascending an inclination of 20 feet per mile; and in proportion for any other inclination. It therefore appears, that to draw a load up an ascent of 20 feet per mile, requires double the power needed to draw it on a level. It must not be inferred from this, that an engine will draw half the useful load up such ascent, that it would on a level; for, in moving up the ascent, the resistance from the gravitation of the engine and tender must be deducted from the power that was available on the level to carry useful load, and the difference in effect, caused by this deduction, will be in the ratio which the weight of the engine and tender bears to the useful load carried; consequently, it will be greater for a train moving at high velocity than for one moving at a low velocity.

The first and second elements of resistance, viz., friction of carriages, and the impact of the air, occur to a train moving on a level; the resistance arising from gravitation, in addition to these, occurs on an ascending plane.

The weight of an engine assumed for the following computation is—

16 tons, with 7 tons (15,680 lbs.) on one pair of driving wheels.

Weight of tender 14 tons.

The ton used in these calculations is 2,240 pounds.

Adhesion 1 10 the insistent weight on drivers.

Friction of cars 8½ lbs. per ton.

Resistance of air 650 lbs.. due to a velocity of 35 miles per hour, against head wind of 10 miles per hour.

The gross load includes the cars and their load, and is *exclusive of the engine and tender.*

Then we have $\frac{15,680}{10}$ =1,568 lbs., tractile power of the engine, and $\frac{1,568-650}{8·5}$ —14 (tender) =94 tons, gross load on a level.

To determine what portion of this the engine will carry up an ascent, we must first deduct the resistance arising from the gravitation of the engine, which will be found (having assumed the resistance from friction of cars as equal to an ascent of 20 feet per mile) by taking such fraction of the weight of the engine and tender as will be in the same ratio to its full weight as the inclination of the plane is to an ascent of 20 feet per mile: and deduct the same from the gross load on a level, before stated; the remainder must be divided by a number that will express the resistance from both friction and gravitation of cars.

We have then for an ascending plane of

10 feet per mile $= \frac{94-(8+7)}{1·5}$ =52 66 tons gross load.

17 feet per mile $= \frac{94-(13·6+11·9)}{1·85}$ =37·03 tons gross load.

For the several planes embraced in the preceding computations, the gross load due to the adhesion, as assumed, appears to be

On a level line.....94·00 tons.
On ascent of 10 feet per mile.....52·66 "
On ascent of 17 feet per mile.....30·03 "

It is assumed (and fully believed) that the engine may be made to generate steam sufficient to move the loads above stated, on the respective planes, at a velocity of 35 miles per hour, and make average time, including stops, of 32 miles per hour; at this speed the trip between New York and Albany would be performed in 4½ hours.

If the road were constructed uniformly on either of the planes embraced in the above computations, the load expressed would be the measure of useful effect on each. But this is not the case on either of the two routes under consideration, as has been shown in the table of grades before given. It is therefore necessary to see how these results will be modified by the different planes, and their lengths on either route.

The ratio of adhesion has been taken at 1-10, and if the velocity of the engine be reduced, a corresponding increase of load may be taken, provided the adhesion be sufficient to transmit the power to the load. It has been stated that the maximum adhesion is 1 6 the insistent weight, and for short distances it may safely be taken at 1-8, if not 1 7; but let it be 1-8, which will be an increase of 25 per cent. Now if the velocity be reduced to 25 miles per hour, the resistance from air will be reduced, according to the basis of the calculation of that resistance, 250 pounds. If this power be applied to overcome the friction and gravitation of additional load, it would be equal to the traction of 30 per cent. of the gross load in this case, and we may, therefore, safely add 1 3 to the load, if this reduction in velocity is permitted. By this reduction in velocity a loss of time is caused, half of which may be regained by an increase of speed on the descending planes, when the power of the engine will be aided by the same amount of gravitation, which was overcome in the ascent. This question will be further modified by the intervening planes of lighter ascent and descent, and those that are level.

Not to go into too much detail, it may suffice to assume that all the grades on the *interior line* that are below 14 feet per mile, will permit the engine to maintain an average speed of 35 miles per hour; and those above this, being for the most part 16 and 17 feet per mile, will cause some retardation. For the *river line*, all that are at and under five feet per mile, will also allow the maintenance of an average speed of 35 miles per hour, and all over this being 10 feet per mile, will cause some retardation. The time required to perform one mile at the rate of 25 miles per hour, is 686 1000 of a minute greater than at the rate of 35 miles per hour, and if half this is regained by increase of speed on the descending planes, the loss of time per mile of heavy plane in the ascent, is equal to

343-1000 of a minute. Multiplying the number of miles in each plane by this fraction, will give the total loss of time caused by the proposed increase of load, and is

For the interior line—
25,312 miles, a 343 = 8 682 minutes.
For the river line—
6,625 miles, a 343 = 2 272 "

Difference in favor of river line - - - 6 410 "

A grade of half a mile in length, of 15 feet per mile, occurs on the river line, which has been included in the length of road having a grade of 10 feet per mile, but has not otherwise been considered, for the reason that it terminates at the point designed for a depot at Poughkeepsie, where the speed would necessarily be reduced for the purpose of stopping the train, and because its length is not sufficient to produce any practical impediment to the progress of the train.

From the computation above stated, it appears that the loss of time by the interior, as compared with the river line, will be about 6½ minutes; but this loss, in consequence of the extra length of the river line, being mainly a level, would have some advantage over the undulating plans of the interior line. It does not, however, appear important to enter into further details.

It is necessary now to determine the number of passengers that may be transported, or that will make up the load of the engine.

For through passengers, with the usual allowance for baggage, the following estimate has been prepared:

A car capable of accommodating 50 passengers, is estimated to weigh, when empty, - -	7 tons.
50 passengers at 150 lbs. each, -	3 34
Baggage, at an average of 40 lbs., with twice and a half the weight in car to carry it, is equal to 140 lbs. per passenger, and 50×140 gives for gross load of baggage and car -	3·12
Total for 50 passengers -	13 46

Equal to 3 64 passengers per ton of gross load.

Consequently, we have on the several planes above investigated, as follows, (adding 1 3 on the ground before stated,) viz:

	Passengers.
On a level - -	94×3 64=342
On ascent of 10 feet per mile, $\left\{52\,66+\frac{52\,66}{3}\right\}$	×3·64=255
On ascent of 17 feet per mile, $\left\{37·03+\frac{37·03}{3}\right\}$	×3·64=180

The trains would probably average 2-3 of a full load, and the number of passengers then would be

	Passengers.
On a level - - -	228
On ascent of 10 feet per mile - -	170
" 17 " -	120

If the running velocity be reduced to 30 miles per hour, and an average of 26 miles per hour, including stops, as for a way train, the load may be increased about 1-3 of the above, and the average would be,

	Passengers.
On a level - - -	304
On an ascent of 10 feet per mile, -	227
" 17 " -	160

The great difference of the loads on the several planes arises from the causes before mentioned, and the large amount of power required to overcome the resistance of the air, which, being nearly the same on all the planes, must first be deducted from the power; thus reducing the useful effect, and varying the ratio of the weight of engine and tender to the total load transported.

To increase the load on the 17 feet ascent, to that above given for a 10 feet ascent, it would not be necessary to increase the power of the engine in the proportion above stated. The resistance from air would be essentially the same, and it would only require sufficient additional power to overcome the resistance from friction and gravitation, which would be about 25 per cent. This, however, does not affect the correctness of the above comparison; it only shows that for a larger engine the ratio of useful effect would compare somewhat more favorably for the heavy planes: for the larger engine, if on a 10 feet plane, at the same velocity, would carry a corresponding increase of load, leaving out of view one element of resistance common to both.

The class of engine assumed in the preceding computations, is one that is regarded as well adapted to a high velocity. It may be found expedient to adopt a larger class; but for the work it may do, this will probably operate as economically as any other, and therefore, the comparison is a good one for the several planes.

Such an engine may be run at an expense of forty cents per mile, and the repairs of cars, road and stations, and all other expenses, will be fully provided for at forty cents more, making the total expense per mile run, eighty cents. To use a larger class of engines, will increase the expense of repairs, both of engines and road, and require a corresponding increase of fuel. The addition of twenty five per cent. to the weight and power of the engine, is estimated to add ten cents per mile to the expenses for power. The data from which this result has been obtained, are not yet clearly settled, as it is not known what the comparative influence of heavy and light wheels is on the cost of both engine and road. The question is regarded, however, in its application to high velocities, as quite important, and experience may show it to be greater than provided for above. As the planes will extend a controlling influence over the whole road, it appears that the expense of a train carrying the same number of passengers by the interior route will be $14 20 more than by the river route.

The averave number of passengers, as before stated, for a train moving at 35 miles per hour, on the river line is 170. The cost of transporting them will be as follows:

On the river line, - -	$115 20
On the interior line - -	129 40

170 passengers at $1 50=$255.
Receipts over expenses:

On the river line, - -	$139 80
On the interior line, - -	125 60

The cost of transportation per passenger at speed of 35 miles per hour, is—

By river line, - -	67 8 10 cents.
By interior line, - -	76 1-10 "

Difference in favor of river line 8 3-10 cts.

In a large passenger train, at a speed of about 22 miles per hour, or so as to make the time between New York and Albany 6½ hours, an engine with two pairs of driving wheels, and weighing 20 tons, would be able to transport—

On the river line, -	500 passengers.
On the interior line, -	375 "

This cost would be the same in either case, except the difference in the additional cars for the larger number, which is estimated at 10 cents for each passenger, or $13 50 on 135, which is the excess in the number of passengers.

The cost is estimated for the train—

River line, at - -	$140 00
Interior line, at - -	126 50

Cost per passenger:

River line, - -	28 cents.
Interior line, - -	33 7 10 "

If the load be reduced 1 5th for an average, the cost will be, on the—

River line, -	35 cents per passenger.
Interior line, -	42 1-10 "

The preceding computations show two important features in the economy of a passenger traffic, viz: That arising from large trains, or a full load, as compared with a partial load; and that arising from a moderate velocity, as compared with a high velocity, a speed of 32 miles average velocity costing about double that of 22 miles.

To be Continued.

St. Lawrence and Atlantic Railroad.

Continued from page 134.

ENGINEER DEPARTMENT, ST L. & A. R.R., *Montreal, January 10, 1848.*

HON. A. N. MORIN, *President.*

SIR: I have the honor to submit my second annual report of the operations of this department.

The Montreal division of your road extending to the township of Acton, a distance of 45 miles, was placed under contract in the fall of 1846, but the season had so far advanced as to allow of but a small amount of work being done before its close.

At the commencement of the past season, measures were early taken for the advancement of the work, under the immediate superintendence of R. T. Bailey, Esq., resident engineer, who had made the location.

The late and unfavorable opening of the spring, the scarcity of laborers, and the financial affairs of the company, during the past season, did not permit so vigorous a prosecution of the work as was desirable—yet very good progress has been made.

Under these circumstances it was deemed advisable to place the force principally on the work of the first 16 miles extending from the St. Lawrence to the Richelieu river, in order that the embankments might become consolidated, and the laying of the track be commenced early the coming season. This work

is in an advanced state, and may be completed and opened for use in the month of August next.

The grading on the east side of the Richelieu river will, in the meantime be urged forward, and completed at the same time, and the extension of the track on this part of the line will be much facilitated by the use of the road for transporting building materials.

A considerable amount of this grading and masonry is, however, already completed, embracing the heavy embankment forming the east approach to the Richelieu river bridge, and the culverts and embankments required in crossing several large ravines at the base of Belœil mountain. The work is in progress on other sections of the road, and there are now about five miles of the grading completed on the east side of Richelieu river.—On the heavier portions of the work, the grading will be continued through the winter.

The Richelieu river bridge is an important structure, and a large amount of work has been done upon it. This bridge consists of six spans of 150 feet each, and a draw near the west shore of 55 feet span. The superstructure is to be erected on the plan of Howe's improved patent, having iron bearings, and to be of the decked form, the track resting on the top chords. The wood work is designed for a single track only, the trusses being placed 12 feet apart in the clear, giving a top width of about 18 feet.

The masonry is designed for a double track and when the second track is required, it may be added by adding the third truss to the superstructure.

The foundations of the piers and abutments are from 45 to 50 feet below the grade of the road, and in water varying from 3 to 8 feet in depth at low water.

There are six piers and two abutments, including the masonry for the draw: the foundations of the abutments, and of all the piers except two, are in, and the masonry carried up, ten feet above low water. Nearly all the stone required for completing the masonry are dressed, and delivered ready to be laid in the spring.

A large portion of the timber and iron required for the superstructure is delivered, and the whole work, it is confidently believed, will be finished by August next.

The country through which the first division of your road is located, presents a uniform and even surface, and is generally in a high state of cultivation.

The roadbed is mostly on embankment varying from three to six feet in height, which is formed generally with earth excavated from side ditches.

This gives a dry and permanent roadbed, and facilitates the removal of snow from the track in winter. The grading is for a single track, having a width of roadbed in excavations of 22 feet, and on embankment 15 feet, with slopes in the ratio of one and a half feet base, to one foot rise.

The ligament of this division of the road may be considered highly favorable, nearly 95 per cent. of the whole distance being straight line.

The following is a synopsis of the grades:

Level	13·20	miles.
From 1 to 10 feet per mile	12·39	"
Do. 10 to 20 "	5·79	"
Do. 20 to 30 "	4·69	"
Do. 30 to 40 "	3·82	"
Do. 40 to 45 "	5·11	"
Total distance	45	"

The track of your road consists of longitudinal sills, 8 × 12 inches square, embedded in gravel or broken stone. Cross ties of Tamarack timber, 2 1 2 inches thick and 6 in. wide, are inserted in the upper side of the sills by a dovetail joint, and retained in their places by wedges of the same description of timber.

The ties have a shoulder of three-quarters of an inch abutting against the inner side of each sill, which with the action of the wedges, draws the whole together to an exact line, and effectually prevents any spreading of the track.

When it is required to renew ties, it is only necessary to knock out the wedges, remove the defective tie, and insert others without disturbing the iron.

The surface of the tie and the longitudinal sill is on the same plane which gives a continuous bearing for the rail.

The rail is of the bridge pattern, weighing 63 lbs. per yard, and is laid along the centre of the sills, to which it is spiked at intervals of about 3 feet. The joints of the rails are secured by cast iron chairs, 5 inches wide, 8 inches long, and three-quarters of an inch in thickness, weighing about 11 lbs. each.

There are three upward projections in the chair, the two outer ones being equal to the thickness of the base of the rail; the middle projection is one inch in height, and fits into the cavity in the centre of the rail.

The chairs are fitted into the sill even with its surface and spiked down, the head of the spikes lapping over the base of the rail, which, together with the projection in the chair, prevents any displacement of the joints.

This form of fastening permits the removal of a rail without disturbing the adjoining one or the chair. To provide for the changes in the length of the bars, caused by variations of temperature, the extremes of which are very great in this climate; also, to guard against a troublesome longitudinal movement of the rail, always experienced on railways, a centre plate of about half the weight of the joint chair is inserted. This plate has a seat for the rail similar to the chair, having two inward projections fitting into openings cut in the base of the rail of corresponding size.

This retains the rail in its position longitudinally, while it requires the movement from change of temperature to take place from and towards the centre of each rail, provision being made for this by leaving sufficient space between the ends when the iron is laid.

This description of track is less liable to derangement from frost, and costs much less for repairs, than a track with cross sills. The motion of the cars is easier and more agreeable to passengers; there is less danger of accidents, and when they do occur, are usually less disastrous. The cost of repairs of machinery is also materially diminished by the smooth, uniform, and slightly elastic surface, afforded by the continuous bearing.

All the timber required for the track of 30 miles of road, has been contracted for, to be delivered at different periods on the line, and at such periods as will allow the whole to be laid the coming season.

There are 1600 tons of iron delivered, which is sufficient for 16 miles of track, and the remainder can be ordered at such time as the progress of the work will require its use.

The business of acquiring the titles to land for roadway and stations, having been performed by the engineer department, it is proper that I should here allude to the subject.

In December, 1846, Mr. Bailey was appointed by the board, commissioner for negotiating for the right of way, and securing to the company in due form, titles to all the lands required for the purposes of the road.

The duties of this office have been performed by Mr. Bailey, in addition to his duties of resident engineer of the first division of the road.

From the report of that gentleman on this subject, it will be perceived that this has been a most arduous and responsible service; unusually so, owing to the great number of proprietors to be settled with, there being 304 in a distance of 30 miles. The farms are usually long and narrow, and the road crosses them in the most unfavorable manner.

Under these circumstances, it becomes necessary to construct numerous crossings, passageways gates, etc., which rendered the final settlement of all claims not only difficult and tedious, but added materially to the expense of construction.

I have the pleasure to state that, of the 304 claimants, 279 have been settled with, and conveyance made to the company, and in nearly all of the remaining cases, the terms upon which the company are to receive the land, have been agreed upon. Little, therefore, remains to be done to close up the whole business of right of way for 30 miles of road, except the making of the payments, and the execution of the deeds for the remaining cases.

Of this distance, 23·7 miles have been settled by negotiations with the proprietors, and the remainder by arbitrators; the average cost of this distance, including notarial and all other expenses, has been £9 per arpent.

The total cost of all the land required for roadway, and stations for 30 miles of road, including all expenses, will be £9,215 15s., which does not vary materially from the original estimated cost. A large amount of ground has been purchased for the St. Lawrence terminus, which will afford ample accommodation for the most extended business.

The building of the gates and fence required for this 30 miles of road, have been contracted for on favorable terms.

The total disbursements made through this department, up to the close of the fiscal year was £80,529 2s. 8d.

Plans, specifications, etc., are completed for the wharf at the terminus, for depot buildings, and the various descriptions of cars required for the business of the road.

I would propose that the buildings be of a

cheap character; of sufficient dimensions to accommodate the anticipated business of the road for several years, reserving the means of the company for the more important purpose of extending the road into the country.

As the road is extended, and its business increased, enlarged buildings of a more permanent character may be erected, suited to the wants of the road when completed.

The surveys for the extension of the road were commenced in May last, at St. Hyacinthe, under the superintendence of W. H. Vining, Esq., an engineer of much experience, and continued till the 1st of December.

It was deemed advisable to organize but one party of engineers, which should be under the immediate direction of a competent engineer, who should inspect personally the whole country, as the surveys advanced.

These surveys cover a great extent of country, the whole of the main line of the road having been surveyed to the boundary line at Canaan, Vermont, and also the branch to the line at Stanstead.

The nature of the country is such between the Yamaska and St. Francis rivers, as to require a number of trial lines to be run, with a view to a selection of the most favorable.

The road is straight after attaining the table land on the east side of the Richelieu river, to a point about three miles east of St. Hyacinthe, giving a tangent, passing this place and crossing the Yamaska river, of nearly 15 miles in length.

From this point, and from St. Hyacinthe, several lines have been surveyed, extending the road on a straight line, to a point in the valley of Moose river—a distance of about 16 miles, crossing the country between the Yamaska and Black rivers, and the latter stream three quarters of a mile above its most northern bend.

These lines cross the Black river twice, and require the channel of Moose river to be changed slightly at two points.

It is desirable to trace other lines across this section of country, one of which should pass the northerly bend of Black river, with a view of avoiding the construction of the two bridges required for the present lines. Other portions of the country between Moose river and the St. Francis, require some further explorations, to determine on the best ground for the final location of the road. This, however, with our present knowledge of the features of the country, may soon be accomplised.

The examinations of this year, demonstrate conclusively, that still further improvements may be made on this part of the line, which will result in a material reduction of the gradients and the cost of the work.

The surveys have been extended through the valley of the St. Francis, and a final location of the road made for a distance of 22½ miles. Considerable curvature is required for this part of the line, but the grades are generally easy, and the work, with some exceptions, is not of an expensive character.

This line leaves the St. Francis valley at Lennoxville, thence the vallies of the Massawippa, Moos, Coatticook and Leach, streams, are followed by the various routes surveyed to the boundary line of the United States.

The diverging point of these several lines is about one and a half miles south of Lennoxville. From this point to the boundary, the country is more irregular, requiring heavier curvatures, gradients and work, than on other portions of the road. It is on this divisicn that the more elevated section of country, dividing the waters of the St. Lawrence and the Connecticut rivers, is crossed.

There are several routes by which the boundary may be reached, two of which have been examined, and also the branch line to Stanstead.

The remaining main routes, and several subordinate ones, connecting those already surveyed, must be examined before a decision can be made as to which the preference should be given for the final location of this part of your road

From the character of the country it became necessary to survey many of these lines with great care, for the purpose of comparison; and in case of their final adoption, they may be regarded as actual locations.

The aggregate length of line surveyed the past season is over 150 miles, of which 70 miles are approximately located, 34 miles definitely located, and the remainder experimental lines.

For the accomplishment of so great an extent of surveys by only one party, I am indebted to the energy and skill of Mr. Vining, and the gentlemen acting as his assistants.

The maps, profiles and estimates, are in progress, and as soon as they are completed, I shall be able to submit for your considration the details and results of these surveys.

I have the honor to be, Sir,

Your obedient servant,

A. C. Morton, *Chief Eng.*

Duties of Shareholders and Directors.

We copy the following just remarks of the able editor of the London Railway Chronicle, in relation to the duties of railway *directors* and *shareholders*.—We look with a good deal of interest for the reports of the principal English railway companies; and shall endeavor to publish some of the principal of them when received.

FORTHCOMING HALF-YEARLY REPORTS.

The general meetings, on the eve of being held for the production of the last half year's accounts, will in some respects exceed in importance any that have hitherto taken place. The condition of railway property, for some time to come, will depend in a great measure on the nature of the reports to be made, as well as on the conclusions announced and the measures determined upon at these meetings. As regards the business during the last six months on lines that are fully at work, it will be a matter of serious interest to all concerned to know what endeavors have been made to obtain from the gross receipts the largest possible share of net income, and what success has attended such endeavors. That directors will have generally felt the importance of strictly controlling the current expenditure, under the circumstances of the last half year, we cannot permit ourselves to doubt. The clear profits realised on the working business, they must know to be the object of peculiar solicitude at the present moment, both as regards the proprietors' satisfaction for their past outlay, and with a view to their confidence in the further operations which are still before them on so large a scale. At a time when the money demanded for the latter is not raised without difficulty, it will naturally be desired that of the earnings of the money already invested, the fullest possible advantage should be taken; and as the value of practical evidence to this effect in the half year's accounts will be great, on the other hand, will the appearance of a contrary result be in no little degree discouraging. To this subject we called especial attention at an early period of the half year now ended—we pointed out some months since the necessity of studying, by every means consistent with the efficiency of the service, to economise expenditure, and to arrange the working business in the most profitable manner for those concerned in its results.

There can be no doubt whatever that, with due regard had to these important objects, much may have been effected in both ways. The reports of the half year's business, to which we shall look with more than usual interest, will show how far they have been attained by the directors in each company respectively.

On many former occasions we have had to remark the passive attitude of proprietors at general meetings, when this topic was presented to them. From them, in such public assemblages, at least, directors have rarely heard the slightest expression, from which it could be discovered that the profits of the business were at all a subject of concern to them—that they were highly interested in obtaining the best possible dividend by the utmost care applicable to the husbanding of its earnings; or that any peculiar anxiety existed in their minds with respect to the future income of their capital. This seeming apathy has often surprised us; it is probable, however, that a very different feeling will be displayed at the forthcoming meetings Nor shall we be at all sorry indeed, to see a change in this respect, provided the proprietors—as will sometimes happen—do not run from one extreme to another; although it may be sincerely regretted that the motive which is likely to quicken their attention to this most essential part of their afforts should be found in the somewhat declining appearance of their property.

We have often said, and we now repeat, that we have no sympathy with captious inquiries, and ignorant suspicions of the directors whom a company have deliberately entrusted with the charge of their undertaking. The vague desire of opposition, no less than a groundless distrust, can only disorder proceedings, discourage practical suggestions and in other ways prejudice the interests at stake. But without falling into any such courses, the proprietors, when periodically called together, may, with the utmost advantage, make known to the directors, temperately and plainly, the importance which they do in reality attach to the matters we are now speaking of.

It is due to themselves; it is no less a duty they owe to the board they have chosen, to represent to it what they feel to be the main objects of their association. This may be done without in the least entrenching on the confidence, generally, and very properly, reposed in their directors; to whom the friendly instructions of the company, on occasions which are especially appointed for the expression of its views and wishes, cannot be otherwise than useful, and can in no sense be deemed either distrustful or intrusive, while conveyed in a proper manner. They are indeed the guarantee against vexatious differences, between a board and its constituents. When these arise, it will generally be found that the breach has been preceded by a long period during which the shareholders have given the directors no trouble whatever, leaving matters to take their course, until at length the results of the proceedings they have gone on passively regarding, or blindly approving of, begin to tell disagreeably on themselves. Their impatience at this stage, is usually in exact ratio to the indifference preceding it; and the proprietors may then be seen quarrelling with the consequences of measures, for which their own neglect of any previous caution, or hint to the directors, makes them as fully responsible as those whom they are at last angrily disposed to censure. Against such contingencies the best remedy—before the business begins to wear a doubtful aspect—is the frank and amicable communication of the proprietors' opinion to their directors; a proceeding useful to both at all times, but most especially apt to show its good effects in seasons when straitened means and somewhat clouded prospects may render it absolutely necessary that the management of affairs should be so handled as to secure the chief and immediate object of these undertakings, in preference to others more inconsiderable and remote.

Gutta Percha.

The Boston Courier gives the following interesting and important letter from Prof. Webster, of the Massachusetts Medical College, in relation to this recently discovered article, which bids fair to be of great utility for a variety of purposes.

If we are not mistaken, the enterprising "*India-rubber King*," H. H. Day, of New York, has fitted out an expedition to Borneo, with ample apparatus for collecting this useful material. We have heard that such is the fact, and if it is so, we shall surely know more about it—as he seldom touches an article, or a business, that does not *adhere*. Such at least has been his operations in the India-rubber line;—and we wish him ample success in this new enterprise.

This substance was first brought under the notice of the Society of Arts in England, in 1843, by Dr. Montgomerie, who obtained specimens of it at Singapore in 1842. The tree from which it is procured is stated by Sir W. J. Hooker to belong to the natural order *Sapotaceæ*. It is found in abundance in many places in the island, and in some dense forests at the extremity of the Malayan peninsula. It is also found on the west coast of Borneo, and is called there Niato. The tree attains a considerable size, even as large as six feet in diameter. The timber is of little or no value, on account of the loose and open character of its tissue; but it bears a fruit which yields a concrete oil, used for food by the natives. Gutta Percha is contained in the sap, and is procured by felling a magnificent tree of 50 or 100 years' growth, the bark is stripped off, and a milky juice exudes, which is collected and poured into a trough, formed by the hollow stem of the plaintain leaf. On exposure to the air, the juice coagulates.—From 20 to 30 lbs. is the average produce of one tree. This wasteful process is adopted to a very large extent, as may be conceived from the amount now imported into England, being many hundred tons annually.

This substance is imported under two forms—in thin scraps like clippings of white leather, and in rolls formed by rolling these layers together in a soft state. In the mass it contains various impurities, which must be removed before it is applicable to some uses. It is purified by kneading in hot water, and then appears of a whitish gray color, ductile, soft and plastic.

At and below the temperature of 50, gutta percha is hard as wood; it is excessively tough, and offers great resistance to an extending power. A ring made from a slip half an inch wide and one tenth of an inch in thickness, I find will support a weight of 150 lbs. without breaking. It has a good deal the appearance of horn, with a somewhat fibrous texture. At a temperature a little below the boiling point of water, it becomes soft, and is then easily cut and moulded into all varieties of form. It may be cut while thus soft, and by slight pressure united again as firmly as before.

Several patents have been taken out in England for methods of applying gutta percha to a vast number of purposes, to all those where caoutchouc has been so long employed and others. It is manufactured into thread for piece goods, ribbons, paper and other articles. Hancock's patent is the most comprehensive, who unites it with caoutchouc and another substance called jintawan, by which an elastic material results, impervious to and insoluble in water. The hardness and elasticity of the compound are varied by varying the proportions of the components. From this a curious substance is made, which is light, porous and spongy, suitable for stuffing the bottoms of seats, cushions, mattrasses, etc. Springs for clocks, clasps, belts and stringe are made of it. By giving it greater hardness, it may be formed into picture frames, incredibly tough canes, door handles, buttons, combs, and maps for the blind, receiving and retaining a clear sharp impression. It has been proposed to apply it as a stopping for decayed teeth, being perfectly harmless. It can be united with coloring matters, and may then be imployed in printing; the colors so printed will probably prove as lasting as the fabrics or materials on which they are impressed. Several months since I received a few specimens of this curious substance for examination. It was found to possess so many valuable and useful properties, and to resist the action of water, acids, and many chemical agents so effectually, that I became desirous of obtaining sufficient for the formation of tubes for the conveyance of gasses, for the cementing brass caps to jars, and other laboratory purposes. In prosecuting experiments upon the specimens I first received, I arrived at a method of dissolving the gutta percha, and of applying it to any surfaces, without the aid of heat. Since receiving a larger supply of the substance, I have prepared from it a variety of articles—tubes, paper and cloth vessels, wholly impervious to water, sheets as thin as gold beater's skin, or as thick as a board, and have had a pair of shoes made from leather prepared with the solution, which are perfectly water proof, and have been put together without sewing, pegs, or nails. These shoes are pronounced by the maker stronger than he could make them by the usual method.

Having been called upon to examine the action of the Cochituate water upon the materials from which the pipes for its distribution in houses will probably be made, I have subjected the gutta percha to its long continued action. The water has received no impregnation whatever, has acquired neither taste or smell, and tubes filled with it have not been ruptured by the freezing of the water contained in them. Believing that, could a supply of gutta percha be obtained, it would be preferable to any other material, especially as regards the health of the community, I took measures for obtaining all the information abroad that could be arrived at. The result is, that the supply of gutta percha in England is as yet not equal to the demand.—Nearly all the raw article that goes to England has as yet been bought up by one company; but still it is to be had in the usual course of trade. The increasing uses for it, and consequent demand, have much raised the price in the past year. The price at late sales was 11d. per lb., to 1s. 3d., according to quality, in the rough lumps in which it is imported from India to China. Little or no tubing had been made, even experimentally, and none sold up to Dec. 2d. But the price of tube about $\frac{3}{4}$ths inch diameter, and of the usual thickness of lead pipe, it was thought would be about 7d. per foot. On the 18th of December the company were not much more forward in their ability to supply tube.

I learn from Washington that several applications for patents for manufacturing gutta percha have been made, but as yet no patents had been issued, although the company in London had sold their rights to parties in the United States.

It may be added, that the solvent I have discovered for gutta percha, is entirely different from ether or spirits of terpentine, in which it had been dissolved in England; that the solution requires no heat, and takes place rapidly, the original property of the gutta remaining unaltered. With a little of this solution, the stop cocks could be firmly attached to the tube, or a leak closed by any person, and the trouble and inconvenience so often experienced where lead pipes are used, would be got entirely rid of. J. W. Webster.

Lab. Mass. Med College, Jan. 24th.

Parcel Traffic on the English Railways.

We continue this subject from the Railway Chronicle, as we deem it one of much importance to railroad companies in this country, as well as in England.

If individuals can pay railroad companies for transporting crates of packages, and send a *special* agent by every train to have charge, and to deliver packages by the way; and then keep offices, clerks, and teams, in each principal city, to receive and deliver articles, why is it not worth the attention of railroad companies to do the same business on their own account, when they will be their own carrier—having a baggage master on the train, office and clerks at each principal stopping place—and can do the same service at half the cost to the community, and large profit to themselves. It seems to us that it is a legitimate, and may be made a very profitable, part of their business.

We shall continue to publish the articles on this subject as they come to hand; and endeavor to show that not only the companies—the stockholders—but also the public have a direct and deep interest in the adoption of a "*railway parcel traffic*," on the cheap system.

Practical Suggestions for Increasing the Parcel Traffic on Railways, etc., etc.,

Continued from page 118.

17. The next inquiry is into the nature of the service which the railways afford to the public in return for this profit of 7½ per cent, the charges to the public, and the principles, if any, which appear to determine and regulate those charges.

The following table exhibits the rates, the weight, and the distances, in the transit of parcels which are or were recently allowed by several of the most important railways:—

18. *Table Showing the Charges and Allowances for Weight made by some of the Largest Railroad Companies, for the Carriage of Small Parcels.*

	Distance in miles.	Present rate.	Weight in lbs.	Rate pr lb at max wt	Remarks.
1. London & N. Western.	Under 40.....	0s. 8d.	under 16	½d.	Above 16 lb. ½d. per lb.
	" 80.....	0 10		0·6	" ½d. per lb.
	" 120.....	1 0		0·7	" 1d. per lb.
	" 160.....	1 6		1·01	" 1½d. per lb.
	" 210.....	2 0		1½	" 2d. per lb.
					Above rates do not apply to parcels consigned beyond the immediate vicinities of the several stations, nor to those proceeding by branch coaches, for which special rates may have been fixed.
2. Eastern Counties.....	Bishop Stortford 32, and under...	0 6	not specified.		Small parcels packed per cwt., 2s. 6d., and 3s. exclusive of collection and delivery.
	Cambridge 52.....	0 7			
	Brandon 88.....	0 8			
3. Great Western.....	Oxford 63.....	0 10	under 12	0·83	Above ½d. per lb.
	Reading 36.....	0 9		0·75	Above ½d. per lb. collection
	Chippenham 94....	1 3		1	Above ½d. per lb. and delivery
	Bristol 119.....	1 3		1·2	Above ½d. per lb. included.
	Exeter 194.....	1 6		1½	Above ½d. per lb.
4. South Western.....	Any place between Farnboro', London, etc., 31.....	0 8	under 28	0·28	Collection at the stations, and delivery within certain distances included.
		1 3	under 56	0·21	
		1 4	" 112	0·14	
	Sauthampton 78....	1 0	" 28	0·4	
	Gosport 88.....	1 6	" 56	0·3	
	Salisbury 94.....	2 0	" 112	0·2	
5. York and N. Midland.	London to York 220.	2 6	" 15	2	Above 15 lb. 2d. per lb.
	York to Birm. 128..	1 6	" 12	1½	Above 12 lb. 1½d. per lb.
	" Sheffield 52.	1 0	" 24	1	Above 25 lb. ½d. per lb.
	" Filey 50....	0 6	" 12	½	Above 12 lb. ½d. per lb.
6. South Eastern.....	London to Dover 88.	1 0	" 14	0·805	Above 28 lb. ½d. per lb.
	Margate 101, or any intermediate place.....	1 6	under 28	0·601	Every additional 28 lb. 6d., or 0·21d. per lb., collected and delivered free within 2½ miles of Somerset House, and to market towns within 3 miles, and other places within a mile of the station. The charge for parcels any distance under 12 miles is two-thirds of the *through* charge; thus 14 lb. cost 8d., or 0·57d. per lb.
7. Brighton & S. Coast—					
London and Brighton, or any intermediate place..	50½	1 0	under 14	0·85	
Or any place on br. lines.	83	1 6	14 to 28	0·64	
London to Hastings.		2 0	28 to 56	0·46	
London to Havant.....	88	2 6	56 to 84	0·35	

19. This table shows what a total absence of all principle there is at present regulating the charges for small parcels on railways. There is disagreement as respects the rate, limit of weight, and the allowance of distance. All, however, agree in avoiding the adoption of that minimum charge per pound, which is fixed after a certain point. The lowest, or commencing charge of the Eastern Counties, and York, and North Midland, is 6d.; the London and North Western and South Western is 8d.; the Great Western is 9d. The London and North Western take 16 lb. 40 miles for 8d.; the South Western take 28 lb. 30 miles for 8d.; the Great Western take 12 lb. 36 miles for 9d.

20. The London and North Western disregard any distance under 40 miles, or between 40 and 80 miles; the Eastern Counties disregard all distance under 30 miles; the Great Western under 36 miles; the South Western under 31 miles; the York and North Midland under 50 miles; but each and all fix a uniform rate by WEIGHT after a certain starting point.

21. The nearest approximation to a principle of charge seems to resolve itself into an average rate of about ½d. per lb. for 40 or 50 miles after a certain fixed maximum weight is attained; but all the railways shrink from applying their rates at a *low* point, and the reason undoubtedly consists in the excessive charges incurred in the receipt and delivery, and in the great amount of risk and responsibility which the present state of the law fixes on railways.

22. It must not be forgotten that this charge of ½d. per pound for 50 miles includes not only carriage on the railway, but the far more costly items of the receipt and delivery of the parcel, and that too in many cases by agencies independent of the railway, such as coaches and small carriers. What proportion of parcels have to bear the cost of an independent agency, for receipt and delivery, it is not very easy to determine accurately, and not very important to be known.

23. It is very difficult to ascertain the cost of this agency precisely, which varies from 2d. to 3d. and 4d. each parcel for delivery, without regard to the weight or size of the parcel. Thus, I believe, the London and North Western pay to the agents, who take 2d. for "booking," at least in London, nothing for receipt, but 4d. for the delivery of each parcel within the three mile circle of St. Martin's-le grand; and 3d. in Birmingham. In small towns and other places within certain moderate distances of the stations, the receipt and delivery are managed by the railway itself and its own porters.

24. These charges, calculated at the maximum weight which they cover, are certainly very low; but, low as they are, they cannot successfully compete with those of the post office or the carriers, owing to the mode in which they are assessed.

25. No one, however, can reasonably contend that the charge already established, say at the rate of ½d. per pound for 50 miles, is not quite as *low* as is necessary for the public, and quite as high as is necessary for the railways, seeing that it yields a profit of 80 per cent. after paying all expenses. But the question arises, is there any *rationale* for disregarding all weight under 16 or 12 lb.? I can discover none, except that the risk of loss makes it the interest of the railways positively to *discourage* small parcels; but this is the consequence of the state of the law, which certainly wants modification. The present system undoubtedly causes *small* parcels to pass through the post office, through the hands of carriers and through private hands. Small parcels are sent from London in many thousands to country booksellers every month indirectly through the large publishing houses, rather than directly through the agency of the railways. This system of evasion is practised to an enormous extent. Every one in a provincial town who has an account with the bookseller of the town, tells his London correspondent to send his parcel to Messrs. Longmans and Whittakers, with 2d. on "magazine" day, and the parcel is thus sent to the country bookseller with his monthly or bi monthly parcel of books. Anomalous as it seems, I know that the railways do not

object to the booksellers' parcels. They prefer bulk, because the risk and great charges for delivery are avoided. Then there are certain parties in London and the large towns who systematically collect small parcels and send them in bulk. The following is a copy of the bill of one of these agents, who drives a flourishing illicit trade in most of the great towns:—

General Parcel Booking office, ———. Parcels forwarded from this office, by —— ——, to all the principal cities and towns in England, every evening, by luggage or mail trains, at the following prices, which, upon comparing them with *any other* tariff, will be seen to be considerably lower than anything ever yet attempted.

Rates Including Delivery.

	Mail train.			Luggage train.		
	Under 1 lb.	Under 6 lb.	Under 8 lb.	Under 6 lb.	Under 12 lb.	Under 18 lb.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Coventry	0 6	0 9	1 0	0 6	0 9	1 0
Birmingnam	0 6	0 9	1 0	0 6	0 9	1 0
Derby	0 9	1 0	1 2	0 9	1 0	1 2
Nottingham	0 9	1 0	1 2	0 9	1 0	1 2
Sheffield	0 9	1 0	1 2	0 9	1 0	1 2
Manchester	1 0	1 3	1 6	0 9	1 0	1 6
Liverpool	1 0	1 3	1 6	0 9	1 0	1 6
Leeds	1 4	1 8	2 0	0 9	1 2	1 8
York	1 6	1 10	2 3	1 0	1 4	1 9
Hull	1 8	2 0	2 6	1 8	2 0	2 6
Newcastle	2 0	2 6	2 9	2 0	2 6	2 9
Bristol	0 6	0 9	1 0	0 6	0 9	1 0
Gloucester	0 9	1 0	1 2	0 9	1 0	1 2
Dublin	2 3	2 6	2 9	2 0	3 0	3 6

From thence despatched to all the towns and villages adjacent.

The railways have it in their power to defeat all this, and get great popularity and profit in doing so.

26. It may be at once admitted that the charge by the railways of only ½d. for a parcel of a single pound would not be sufficiently remunerative; but granting this, there is surely no reason for making the charge at once always as high as 6d., and generally much higher. If smuggling can with profit take a parcel for 6d. to Coventry by means of the railway, why should not the railway do it?

27. The four great elements of cost in the transit of railway parcels are receipt, carriage, delivery, and risk. I will endeavor to determine what these are:—First, as respects carriage; an analysis of the London and Birmingham accounts, before mentioned, for six months in 1845, shows that for parcels per ton per mile, the receipts were 18·166d.; charges, 3·566d.; net receipts 14·600d.

28. Thus we see that the cost *per ton* per mile for maintenance of way, locomotive, police, coaching, and merchandise, coach and truck repairs, general charges, mileage duty, depreciation, rates and taxes, and delivery, and in fact, for all charges whatever in the gross, amounts in the whole to 3·566d., or about 3½d. per mile, but say 4d., to take a round number; 4d. per ton per mile is at the rate of 0.0017d. per pound per mile, so that the cost per pound to take it from London to Birmingham, 112 miles, and there deliver it, is just at the rate of 0.2l., or less than a farthing, including all charges whatever.

29. This calculation is based upon the gross weight and gross receipts from parcels; but as 0·2d. per pound pay all these expenses in the gross, *a fortiori*, that sum may be taken as an ample allowance for the cost of the railway expenses proper only, EXCLUSIVE OF RECEIPT AND DELIVERY. The cost of *carriage*, meaning locomotion only, per pound is the same to the railway, whether the pounds be separate pounds or several in one parcel. We will therefore assume 0·2d. as ample payment for the carriage only, of a pound for 112 miles.

30. Now what shall we add for *receipt* and *delivery?* What is the cost to the railway at present? Nothing for receipt, but 3d. for delivery in Birmingham, and 4d. in London. In small places the delivery is executed by the porters of the railway, and does not become an extraneous cost. Most probably the average cost of receipt and delivery, taking all parcels whatever, is not 3d. per parcel. And this sum, if the number of parcels were increased, might certainly be reduced.

31. The present charges of 3l. for delivery in Birmingham, and 4d. in London, is a high charge, and one which doubtless stands in the way of much improvement in the mode of assessment. If the post office, besides carrying, can receive and deliver letters for 1d. with great profit, as it does, it is fair to ask another agency to do the latter services only for parcels at 2d. The weight of the parcel within certain reasonable limits does not affect the cost of receipt and delivery. Newspaper vending proves how cheap agency may be. The *Times* is actually fetched six, eight, ten miles, and then conveyed and delivered at subscribers' houses for 1d., the vendor taking also the risk of payment of the other 4d. The *Daily News* gives the vendor little more than ½d. for the same trouble. With systematic agency 2d. would be an ample remuneration for the receipt and delivery, including risk, of any parcel under 14 lb. weight within the three mile circle of St. Martin's-le-grand in the metropolis, and certain limits in the large towns. If the *metropolitan railways would combine to deliver parcels*, it might be done with profit at this sum; and we shall come to this at last.

32. The cost on a parcel a pound weight from London to Birmingham would therefore stand thus—

Receipt and delivery, (including cost and risk) say ..... 2d.
Carriage and other railway expenses ..... 0·2

What would be a proper charge to the public? If we say 3d., the railway would get more than 0·8d. clear profit; but it must be quite obvious that it would get this profit upon a much larger amount of business than it now does, and therefore the business would be so much the more remunerative. Besides, in those cases where there was no outgoing for delivery, the railway would get the full penny charged for it. To begin the scale of charge at one pound, and fix a charge of 3d., or say 4d. for it, between London and Birmingham, would be an immense boon to the public.

33. The charge being so *low*, it would be quite unnecessary to have any proportionate reduction of charge for the intermediate distances between London and Birmingham. No proportionate charge would therefore have to be made. Three or four pence (take 4d. if you please,) would be the charge for the transmission of a parcel of one pound in weight from London to Birmingham, and any place short of Birmingham. Hereafter the proper charges for subsequent weights will be determined

34. By the adoption of this charge, the railway might at once obtain every parcel above a quarter of a pound that now passes through the post office, other arrangements being suitable.

(To be continued.)

TO LOCOMOTIVE AND MARINE ENGINE Boiler Builders. Pascal Iron Works Philadelphia. Welded Wrought Iron Flues, suitable for Locomotives, Marine and other Steam Engine Boilers, from 2 to 5 inches in diameter. Also, Pipes for Gas, Steam and other purposes; extra strong Tube for Hydraulic Presses; Hollow Pistons for Pumps of Steam Engines, etc. Manufactured and for sale by

MORRIS TASKER & MORRIS,
Warehouse S. E. corner 3d and Walnut Sts., Philadelphia
1tf

THE SUBSCRIBER IS PREPARED TO execute at the Trenton Iron Works, orders for Railroad Iron of any required pattern, and warranted equal in every respect in point of quality to the best American or imported Rails. Also on hand and made to order, Bar Iron, Braziers' and Wire Rods, etc., etc.

PETER COOPER 17 Burling Slip.
1y10 New York.

IMPORTANT TO ENGINEERS, CONTRACTORS, and Surveyors.—The Engineer's, Contractor's and Surveyor's Pocket Table Book, by J. M. Scribner, A. M., 264 pages, 24 mo; tuck binding, with gilt edge. Published by Huntington & Savage, 216 Pearl street, New York.

The above work comprises Logarithms of Numbers, Logarithmic Sines and Tangents, Natural Sines and Natural Tangents; the Traverse Table, and a full and extensive set of tables, *exhibiting at one view the number of cubic yards contained in any embankment or cutting, and for any base or slope of sides usual in practice.* Besides these essential tables, the work comprises 50 pages more of Mensuration, Tables, Weights of Iron, Strength of Materials, Formulas, Diagrams, etc., for laying out railroads, canals and curves; much of which has never before been offered to the public, and all dispensable to the engineer. This book will prove a great saving of time, and will enable the new beginner to furnish results as accurately (and with much greater rapidity) as the most experienced in the profession without its aid. The tables of Logarithms, etc., have been carefully corrected and compared with *different* editions of the same tables; and *all* the tables throughout the book have been read carefully by proofs four times; hence the most implicit confidence may be placed in their correctness.

Also, *Scribner's Engineer's and Mechanic's Companion*, new edition, 264 pages, enlarged, with 35 pages of entirely new matter, and much improved throughout.

It is believed these books are so well adapted to suit the above professions, that they cannot *afford* to do without them, and that they will aid in rewarding well directed mental labor.

Both are for sale by all the principal booksellers throughout the United States and Canada.

NOTICE TO RAILROAD CONTRACTORS. The completion of the Western and Atlantic Railroad of the State of Georgia, from Dalton to Chattanooga on the Tennessee river—38 miles, and a tunnel for a single track, 1400 feet long.

Sealed proposals will be received, until the 20th day of March next, at the Chief Engineer's office, of the Western and Atlantic Railroad in Atlanta, Georgia, for the completion of the grading and masonry, the bridging, superstructure, iron rails and fastenings, single track tunnel 1400 feet long, depots, turn tables, turnouts, pumps and everything else necessary for the reception of the locomotives and cars, on that portion of the Western and Atlantic railroad lying between Dalton and Chattanooga.

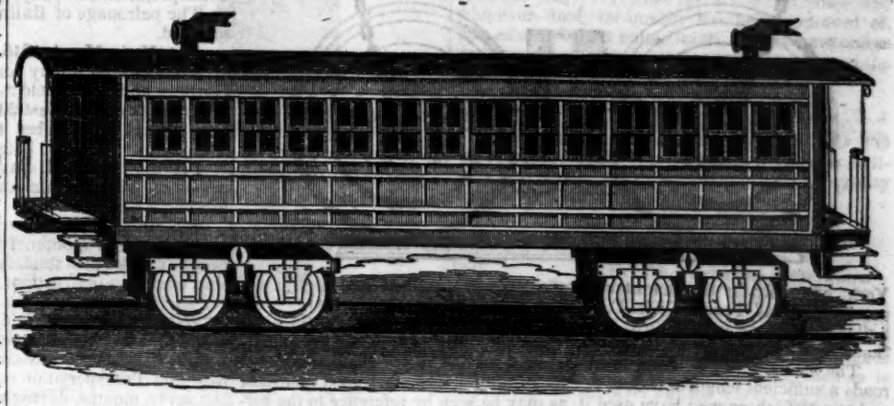
Proposals are invited for *detached portions* of said work, and also for *the whole in one contract*, according to the Act of the Legislature, approved the 30th December, 1847.

Plans and specifications can be examined, and detailed information given at the Chief Engineer's office, in Atlanta, on and after the 21st of February next. GEO. W. TOWNS, *Governor.*

WM. L. MITCHELL, *Chief Engineer.*
Atlanta, Ga., January 24, 1848. [7t6]

RAILROAD IRON AND LOCOMOTIVE Tyres imported to order and constantly on hand by A. & G. RALSTON
Mar. 20tf 4 South Front St., Philadelphia.

DAVENPORT & BRIDGES'
CAR WORKS, CAMBRIDGEPORT, MASS.

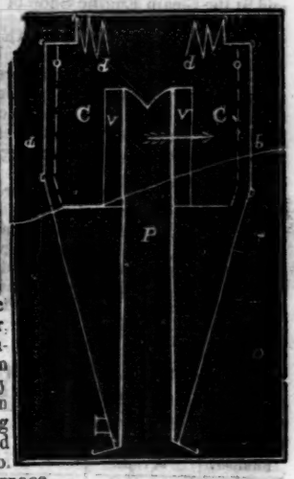


Manufacture to Order, Passenger and Freight Cars of every description, and of the most improved pattern; also furnish Snow Ploughs and Chilled Wheels of any pattern and size. Forged Axles, Springs, Boxes and Bolts for Cars at the lowest prices.

All orders punctually executed and forwarded to any part of the country.

Our Works are within fifteen minutes ride from State street, Boston—Omnibuses pass every fifteen minutes. 10tf

FRENCH AND BAIRD'S PATENT SPARK ARRESTER.



TO THOSE INTERESTED IN Railroads, Railroad Directors and Managers are respectfully invited to examine an improved Spark-Arrester recently patented by the undersigned.

Our improved Spark Arresters have been extensively used during the last year on both passenger & freight engines, and have been brought to such a state of perfection that no annoyance from sparks or dust from the chimney of engines on which they are used is experienced.

These Arresters are constructed on an entirely different principle from any heretofore offered to the public The form is such that a rotary motion is imparted to the heated air smoke and sparks passing through the chimney, and by the centrifugal force thus acquired by the sparks and dust they are separated from the smoke and steam, and thrown into an outer chamber of the chimney through openings near its top, from whence they fall by their own gravity to the bottom of this chamber; the smoke and steam passing off at the top of the chimney, through a capacious and unobstructed passage, thus arresting the sparks without impairing the power of the engine by diminishing the draught or activity of the fire in the furnace.

These chimneys and arresters are simple, durable and neat in appearance. They are now in use on the following roads, to the managers and other officers of which we are at liberty to refer those who may desire to purchase or obtain further information in regard to their merits

R. L. Stevens, President Camden and Amboy Railroad Company; Richard Peters, Superintendant Georgia Railroad, Augusta, Ga.; G. A. Nicolls, Superintendant Philadelphia, Reading and Pottsville Railroad, Reading, Pa.; W. E. Morris, President Philadelphia, Germantown and Norristown Railroad Company, Philadelphia; E. B. Dudley, President W. and R. Railroad Company, Wilmington, N. C.; Col. James Gadsden, President S. C. and C. Railroad Company, Charleston, S. C.; W. C. Walker, Agent Vicksburgh and Jackson Railroad, Vicksburgh, Miss.; R. S. Van Rensselaer, Engineer and Sup't Hartford and New Haven Railroad; W. R. M'Kee, Sup't Lexington and Ohio Railroad, Lexington, Ky.; T. L. Smith, Sup't New Jersey Railroad Trans. Co.; J. Elliott, Sup't Motive Power Philadelphia and Wilmington Railroad, Wilmington, Del.; J. O. Sterns, Sup't Elizabethtown and Somerville Railroad; R. R. Cuyler, President Central Railroad Company, Savannah, Ga.; J. D. Gray, Sup't Macon Railroad, Macon, Ga.; J. H. Cleveland, Sup't Southern Railroad, Monroe, Mich.; M. F. Chittenden, Sup't M. P. Central Railroad, Detroit, Mich.; G. B. Fisk, President Long Island Railroad, Brooklyn.

Orders for these Chimneys and Arresters, addressed to the subscribers, care Messrs. Baldwin & Whitney, of this city or to Hinckly & Drury, Boston, will be promptly executed. FRENCH & BAIRD.

N. B.—The subscribers will dispose of single rights, or rights for one or more States, on reasonable terms.

Philadelphia, Pa., April 6, 1844.

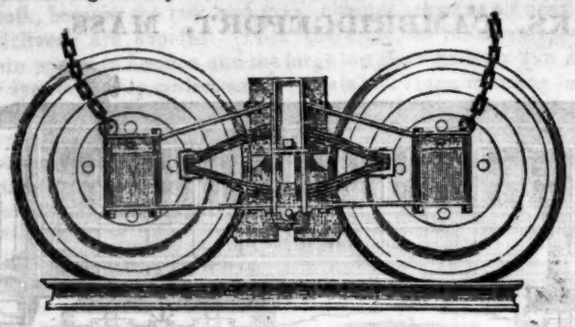
*** The letters in the figures refer to the article given in the *Journal* of June, 1844. ja45

LOCOMOTIVE AND CAR AXLES. The Subscribers are now prepared to receive orders for the well known and approved *Reading Locomotive and Car Axles*—drawn to any required pattern from *Bloom Iron only.* Address

SAM'L KIMBER & CO.,
Willow Street Wharf,
1tf Philadelphia, Pa.

RAILROAD IRON.—THE "MONTOUR Iron Company," Danville, Pa., is prepared to execute orders for the heavy Rail Bars of any pattern now in use, in this country or in Europe, and equal in every respect in point of quality. Apply to MURDOCK, LEAVITT & CO., *Agents.*
1y48 77 Pine St., New York.

RAY'S EQALIZING RAILWAY TRUCK.—THE SUBSCRIBER having recently formed a business connection in the City of New



York, expressly for the manufacture of the newly patented and highly approved Railroad Truck of Mr. Fowler M. Ray, is ready to receive orders for building the same, from Railroad Companies and Car Builders in the United States, and elsewhere.

The above Truck has now been in use from one to two years on several roads a sufficient length of time to test its durability, and other good qualities, and to satisfy those who have used it, as may be seen by reference to the certificates which follow this notice.

There have been several improvements lately introduced upon the Truck, such as additional springs in the bolster of passenger cars, making them delightful riding cars—adapting it to tenders, trucks forward of the locomotive, and freight cars, which, with its original good qualities, make it in all respects the most desirable truck now offered to the public.

Orders for the above, will, for the present, be executed at the New York Screw Mill, corner 33d street and 3d avenue, (late P. Cooper's rolling mills) and at the Steam Engine Shop of T. F. Secor & Co., foot of 9th street, East river, (of which firm the subscriber was late a partner) under the immediat supervision of Mr. Ray himself.

Several sets of trucks containing the latest improvements have recently been turned out for the New York and Erie railroad, and the New Jersey Transportation company, which may be seen upon said roads.

The patronage of Railroad Companies and Car Builders is respectfully solicited.

New York, May 4, 1846. W. H. CALKINS, and Others.

To all whom it may concern:—This is to certify that the New Haven, Hartford and Springfield railroad co., have had in use six sets of F. M. Ray's patent trucks for the last 20 months, during which time it appears to me, they have proved to be the bes and most economical truck now in use.

[Signed,] WILLIAM ROE, Sup't of Power.

I certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Philadelphia and Reading railroad for some time past, under a passenger car.

For simplicity of construction, economy in cost, lightness of material, and extreme ease of motion, I consider it the best truck we have ever used. Its peculiar make also renders it less liable to be thrown off the track, when passing over any obstruction. We intend using it extensively under the passenger and freight cars of the above road.

Reading, Pa., October 6, 1845. [Signed,] G. A. NICOLL, Sup,t Transportation, etc., Philadelphia and Reading Railroad.

To all whom it may concern:—This is to certify that the N. Jersey Railroad and Transportation company have used Fowler M. Ray's Truck for the last seven months, during which time it has operated to our entire satisfaction. I have no hesitation in saying that it is the simplest and most economical truck now in use. [Signed,] T. L. SMITH,

Jersey City, November 4, 1845. N. Jersey Railroad and Transp. Co.

This is to certify that F. M. Ray's Patent Equalizing Railroad Truck has been in use on the Long Island railroad for the last year, under a freight car.

For simplicity of construction, economy in cost, lightness of material and ease of motion, I consider it equal to any truck we have in use.

Long Island Railroad Depot, Jamaica November 12, 1845. } [Signed,] JOHN LEACH, Sup't Motive Power.

1y19

ENGLISH PATENT WIRE ROPES—FOR THE USE OF MINES, RAILWAYS, ETC.—for sale or imported to order by the subscriber.

These Ropes are manufactured on an entirely different principle from any other, and are now almost exclusively used in the collieries and on the railways in Great Britain, where they are considered to be greatly superior to hempen ones, or iron chains, as regards safety, durability and economy. The plan upon which they are made effectually secures them from corrosion in the interior, as well as the exterior of the rope, and gives a greater compactness and elasticity than is found in any other manufacture.

Many of these ropes have been in constant operation in the different mines in England, and on the Blackwall and other inclined planes, for three and four years, and are still in good condition.

They have been applied to almost every purpose for which hempen ropes have been used—mines, heavy cranes, standing rigging, window cords, lightning conductors, signal halyards, tiller ropes, etc. Reference is made to the annexed statement for the relative strength and size. Testimonials from the most eminent engineers in England can be shown as to their efficiency, and any additional information required respecting the different descriptions and application will be given by

ALFRED L. KEMP,
75 Broad street, New York, sole agent in the United States.

Statement of Trial made at the Woolwich Royal Dock Yard, of the Patent Wire Ropes, as compared with Hempen Ropes and Iron Chains of the same strength.—October, 1841.

WIRE ROPES.				HEMPEN ROPES.			CHAINS.		STRENGTH
Wire gauge number.	Circumference of rope.	Weight per fathom.		Circumference of rope.	Weight per fathom.		Weight per fathom.	Diameter of iron.	Tons.
	INCH.	LBS.	OZ.	INCH.	LBS.	OZ.	LBS.	INCH.	
11	4¼	13	5	10	24	–	50	15-16	20
13	3¼	8	3	8½	16	–	27	11-16	13½
14	3¼	6	11	7½	12	8	17	9-16	10½
15	2¾	5	2	6½	9	4	13½	1-2	7½
16	2¼	4	3	6	8	8	10½	7-16	7

N.B. The working load, with a perpendicular lift, may be taken at 6 *cwt. for every lb. weight per fathom, so that a rope weighing* 5 *lbs. per fathom would safely lift* 3360 *lbs., and so on in proportion.* 1y24

RAILROAD SCALES.—THE ATTENTION of Railroad Companies is particularly requested to Ellicotts' Scales, made for weighing loaded cars in trains, or singly, they have been the inventors, and the first to make platform scales in the United States; supposing that an experience of **20** years has given a knowledge and superior advantage in the business.

The levers of our scales are made of wrought iron, all the bearers and fulcrums are made of the best cast steel, laid on blocks of granite, extending across the pit, the upper part of the scale only being made of wood. E. Ellicott has made the largest Railroad Scale in the world, its extreme length was one hundred and twenty feet, capable of weighing ten loaded cars at a single draft. It was put on the Mine Hill and Schuylkill Haven Railroad.

We are prepared to make scales of any size to weigh from five pounds to two hundred tons.

ELLICOTT & ABBOTT.
Factory, 9th street, near Coates, cor. Melon st.
Office, No. 3 North 5th street,
1y25 Philadelphia, Pa.

NICOLL'S PATENT SAFETY SWITCH for Railroad Turnouts. This invention, for some time in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design.

It acts independently of the main track rails, being laid down, or removed, without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two Castings and two Rails; the latter, even if much worn or used, not objectionable.

Working Models of the Safety Switch may be seen at Messrs. Davenport and Bridges, Cambridgeport, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained on application to the Subscriber, Inventor, and Patentee G. A. NICOLLS,
ja15 *Reading, Pa.*

TO RAILROAD COMPANIES AND MANUFACTURERS of railroad Machinery. The subscribers have for sale Am. and English bar iron, of all sizes; English blister, cast, shear and spring steel; Juniata rods; car axles, made of double refined iron; sheet and boiler iron, cut to pattern; tiers for locomotive engines, and other railroad carriage wheels, made from common and double refined B. O. iron; the latter a very superior article. The tires are made by Messrs. Baldwin & Whitney, locomotive engine manufacturers of this city. Orders addressed to them, or to us, will be promptly executed.

When the exact diameter of the wheel is stated in the order, a fit to those wheels is guaranteed, saving to the purchaser the expense of turning them out inside. THOMAS & EDMUND GEORGE,
a45 N. E. cor. 12th and Market sts., Philad., Pa.

THE NEWCASTLE MANUFACTURING Company continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack screws, Wrought iron work and Brass and Iron castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

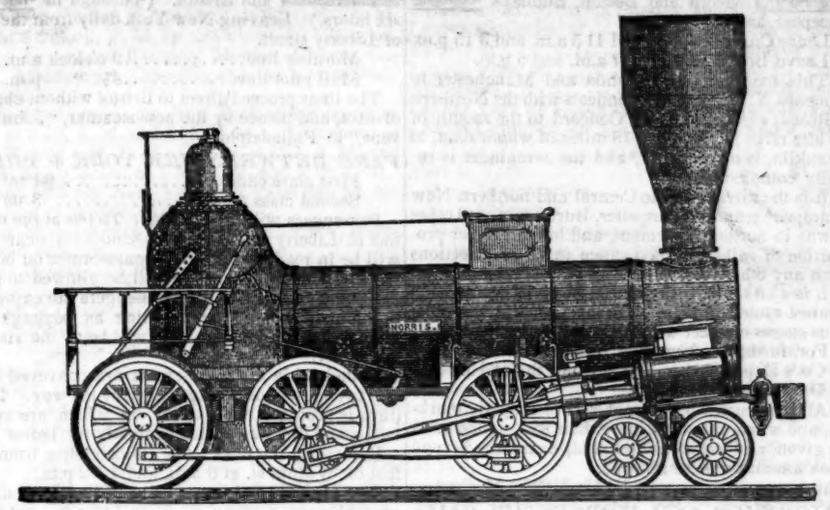
The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention. ANDREW C. GRAY,
a45 President of the Newcastle Manuf. Co.

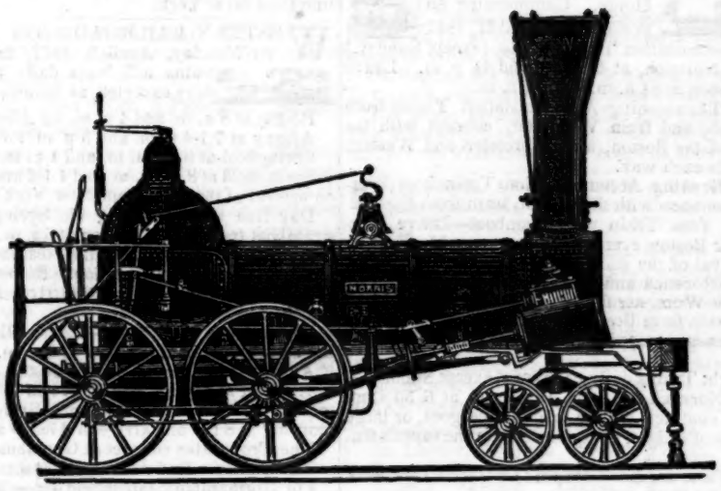
KEARNEY FIRE BRICK. F. W BRINLEY, Manufacturer, Perth Amboy N. J. Guaranteed equal to any, either domestic or foreign. Any shape or size made to order. Terms mos. from delivery of brick on board. Refer to

James P. Allaire, Peter Cooper, Murdock, Leavirt & Co. } New York.
J. Triplett & Son, Richmond, Va.
J. R. Anderson, Tredegar Iron Works, Richmond, Va.
J. Patton, Jr. Colwell & Co. } Philadelphia, Pa.
J. M. L. & W. H. Scovill, Waterbury, Con.
N. E. Screw Co. Eagle Screw Co. } Provicence, R. I.
William Parker, Supt. Bost. and Worc. R. R.
New Jersey Malleable Iron Co., Newark N. J
Gardiner, Harrison & Co. Newark, N. J
25,000 to 30,000 made weekly. 35

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA,





THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusunl advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS' BROTHERS.

MACHINE WORKS OF ROGERS, Ketchum & Grosvenor, Patterson, N. J. The undersigned receive orders for the following articles, manufactured by them of the most superior description in every particular. Their works being extensive and the number of hands employed beinglarge, they are enabled to execute both large and small orders with promptness and despatch.

Railroad Work.

Locomotive steam engines and tenders; Driving and other locomotive wheels, axles, springs & flange tires; car wheels of cast iron, from a variety of patterns, and chills; car wheels of cast iron with wrought tires; axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery

of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and Millwright work generally; hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
Paterson, N. J., or 60 Wall street, N. York.

PIG AND BLOOM IRON.—THE SUBSCRIbers are agents for the sale of numerous brands of Charcoal and Anthracite Pig Iron, suitable for Machinery, Railroad Wheels, Chains, Hollowware, etc. Also several brands of the best Puddling Iron, Juniatta Blooms suitable for Wire, Boiler Plate, Axe Iron, Shovels, etc. The attention of those engaged in the manufacture of Iron is solicited by

A. WRIGHT & NEPHEW,
12tf Vine St. Wharf, Philadelphia.

T. & C. WASON, Manufacturers of every style of Freight and Baggage Cars.—Forty rods east of the depot, Springfield, Mass.

Running parts in sets complete, Wheels, Axles, or any part of cars furnished and fitted up at short notice and in the best manner.

N.B. Particular attention paid to the manufacture of the *most improved* Freight Cars. We refer to the New Haven, Hartford and Springfield; Connecticut River; Harlem; Housatonic, and Western, Mass., Railroads, where our cars are now in constant use.

Dec. 25 1847.—1y.

SPRING STEEL FOR LOCOMOTIVES, Tenders and Cars. The Subscriber is engagep in manufacturing Spring Steel from 1¼ to 6 inches in width, and of any thickness required: large quantities are yearly furnished for railroad purposes, and wherever used, its quality has been approved of. The establishment being large, can execute orders with great promptitude, at reasonable prices, and the quality warranted. Address

JOAN F. WINSLOW, *Agent*,
1y Albany Iron and Nail Works,

THE SUBSCRIBERS ARE PREPARED TO execute orders at their Phœnix Works for Railroad Iron of any required pattern, equal in quality and finish to the best imported.

REEVES, BUCK & CO.,
Philadelphia.
ROBERT NICHOLS, Agent,
26tf No. 79 Water St., New York.

CHILLED RAILROAD WHEELS.—THE undersigned are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of Spokes or Disks, by a new process which prevents all strain on the metal, such as is is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St. below 13th,
Nov. 10, 1847. [tf.] Philadelphia, Penna.

PATENT HAMMERED RAILROAD, SHIP and Boat Spikes. The Albany Iron and Nail Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes, from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscriber at the works, will be promptly executed. JOHN F. WINSLOW, *Agent*.

Albany Iron and Nail Works, Troy, N. Y.

The above spikes may be had at factory prices, of Erastus Corning & Co., Albany; Hart & Merritt, New York; J. H. Whitney, do.; E. J. Etting, Philadelphia; Wm. E. Coffin & Co Boston. ja45

PATENT RAILROAD, SHIP AND BOAT Spikes. The Troy Iron and Nail Factory keeps constantly for sale a very extensive assortment of Wrought Spikes and Nails, from 3 to 10 inches, manufactured by the subscriber's Patent Machinery, which after five years' successful operation, and now almost universal use in the United States (as well as England, where the subscriber obtained a patent) are found superior to any ever offered in market.

Railroad companies may be supplied with Spikes having countersink heads suitable to holes in iron rails, to any amount and on short notice. Almost all the railroads now in progress in the United States are fastened with Spikes made at the above named factory—for which purpose they are found invaluable, as their adhesion is more than double any common spikes made by the hammer.

All orders directed to the Agent, Troy, N. York will be punctually attended to.

HENRY BURDEN, *Agent*.

Spikes are kept for sale, at Factory Prices, by I. & J. Townsend, Albany, and the principal Iron merchants in Albany and Troy; J. I. Brower, 222 Water St., New York; A. M. Jones, Philadelphia; T. Janviers, Baltimore; Degrand & Smith, Boston.

*** Railroad Companies would do well to forward their orders as early as practicable, as the subscriber is desirous of extending the manufcturing so as to keep pace with the daily increasing demand.

ja45

RAILROAD IRON—800 TONS OF THE latest and most improved pattern of T Rail—weighing about 60 lbs. to the yard, for sale by

BOORMAN, JOHNSTON & CO.,
1m ja 1 119 Greenwich St., New York.

BOSTON AND MAINE RAILROAD.
Upper Route, to Portland and the East.


WINTER ARRANGEMENT,

Commencing October 4, 1847.

PORTLAND TRAINS.

Leave Boston at 7 A.M. and 2½ P.M.
Leave Portland at 7½ A.M. and 3 P.M.

GREAT FALLS TRAIN.

Leave Boston at 3½ P.M.
Leave Great Falls at 6½ A.M.

LAWRENCE TRAINS.

Leave Boston at 7, 11½ a.m., 2½, 3½, 5½ p.m.
Leave Lawrence at 7, 8½, 11 a.m., 3½, 6½ p.m.

HAVERHILL TRAINS.

Leave Boston at 11½ A.M. and 5½ P.M.
Leave Haverhill at 7 A.M. and 3½ P.M.

READING TRAINS.

Leave Boston at 8½ A.M. and 6½ P.M.
Leave Reading at 6 50 A.M. and 1½ P.M.

MEDFORD BRANCH TRAINS.

Leave Boston at 7½, a.m., 12 m., 2½, 4½, 6 p.m.
Leave Medford at 7, 8½, a.m., 1½, 3½, 5 p.m.

The Depot in Boston is on Haymarket Square.
1y31 CHAS. MINOT, *Sup't.*

BOSTON AND PROVIDENCE RAILROAD. Passenger Notice. Summer Arrangement. On and after Monday, April 5, 1847, the Passenger Trains will run as follows:

Steamboat train via Stonington—Leaves Boston every day, except Sunday, at 5 o'clock p.m.

Accommodation Trains—leave Boston at 7 and 10½ a.m. and 4 p.m., and Providence at 7½ and 10½ a.m. and 4½ p.m.

Dedham trains, leave Boston at 8 a.m., 12½, 3½, 6½ and 9 p.m., Leave Dedham at 7 and 9½ a.m. and 2½, 5½ and 8 p.m.

Stoughton trains, leave Boston at 11½ a.m. and 5½ p.m. Leave Stoughton at 7 10 a.m. and 3½ p.m.

All baggage at the risk of the owners thereof.
25tf W. RAYMOND LEE, *Sup't.*

NEW YORK & HARLEM RAILROAD CO.—Summer Arrangement.—On and after Tuesday, June 1st, 1847, the cars will run as follows, until further notice. Up trains will leave the City Hall for—

Yorkville, Harlem and Morrisana at 6, 8 and 11 a.m., 2, 2 30, 5 and 7 p.m.

For Morrisiana, Fordham, Williams' Bridge, Tuckahoe, Hart's Corner and White Plains, 7 and 10 a.m., 4 and 5 30 p.m.

For White Plains, Pleasantville, Newcastle, Mechanicsville and Croton Falls, 7 a.m. and 4 p.m. Freight train at 1 p.m.

Returning to New York, will leave—

Morrisiana and Harlem, 7, 8 20 and 9 a.m., 1, 3, 4 30, 6, 6 28 and 8 p.m.

Fordham, 8 08 and 9 15 a.m., 1 20 and 6 15 p.m.

Williams Bridge, 8 and 9 08 a.m., 1 10, 6 08 p.m.

Tuckahoe, 7 38 and 8 25 a.m., 12 55 and 5 52 p.m.

White Plains, 7 10 and 8 35 a.m., 12 50, 5 35 p.m.

Pleasantville, 8 15 a.m. and 5 15 p.m.

Newcastle, 8 a.m. and 5 p.m.

Mechanicsville, 7 48 a.m. and 4. 48 p.m.

Croton Falls, 7 30 a.m. and 4 30 p.m. Freight train at 10 a.m.

Freight train will leave 32d street for Croton Falls and intermediate places, 4 a.m and City Hall 1 p.m.

Returning, leave Croton Falls 10 a.m. and 9½ p.m.

ON SUNDAYS, the trains will run as follows:

Leave City Hall for Croton Falls, 7 a.m, 4 p.m.

Croton Falls for City Hall, 7 30 a.m., 4 30 p.m.

Leave City Hall for White Plains and intermediate places, 7 and 10 a.m. 4 and 5 30 p.m.

White Plains for City Hall, 7 10 and 8 35 a.m., 12 30 and 5 35 p.m.

Extra trains will be run to Harlem, Fordham and Williams Bridge on Sunday, when the weather is fine.

The trains to and from Croton Falls will not stop on N. York island, except at Broome st. and 32d st.

A car will precede each train 10 minutes to take up passengers in the city.

Fare from New York to Croton Falls and Somers $1, to Mechanicsville 87½c., to Newcastle 75c., to Pleasantville 69½c. to White Plains 50c. 25tf

CONCORD RAILROAD.—PASSENGER Trains in connection with the Lowell & Nashua Railroads, run daily between Concord and Boston, Sundays excepted, as follows. viz:

Leave Concord at 5 40 and 11 5 a.m. and 3 15 p.m.

Leave Boston at 7 and 11 a.m. and 5 p.m.

This road runs by Nashua and Manchester to Concord N. H., where it connects with the Northern railroad, extending from Concord to the mouth of White river in Vermont, 18 miles of which road, to Franklin, is now opened, and the remainder is rapidly completing.

It is the direct route to Central and northern New Hampshire, and to Montpelier, Burlington, and other towns in northern Vermont, and has a greater proportion of railroad conveyance in those directions han any other line.

It is also the British Steam Mail Line, and the nearest route from Boston to the Canadas. Numerous stages connect with all parts of the road.

For further information, apply at B. P. Cheney & Co.'s Express office, No. 8 Court St., and Averill & Dean, No. 15 Elm St.

All passengers' baggage should be properly marked, and when valued at more than $50, notice must be given, and extra charges paid, or no loss beyond such amount will be allowed.
26tf N. G. UPHAM, Supt.

NORWICH AND WORCESTER RAILROAD. Summer Arrangement. Change of Hours. Commencing on Wednesday, April 21, 1847.

Accommodation Trains, daily, (except Sunday.) Leave Norwich, at 6 a. m., and 4½ p. m. Leave Worcester, at 8½ a. m., and 4½ p. m.

☞ The morning Accommodation Trains from Norwich, and from Worcester, connect with the trains of the Boston, and Worcester and Western railroads each way.

The Evening Accommodation Train from Worcester connects with the 2½ p.m. train from Boston.

New York Train via Steamboat—Leave Norwich for Boston, every morning, except Monday, on the arrival of the stamboat from New York, stopping at Norwich and Danielsonville.

Leave Worcester for New York, upon the arrival of the train from Boston, at about 6½ p.m., daily, except Sunday, stopping at Danielsonville and Norwich.

Freight Trains daily each way, except Sunday.—Leave Norwich at 7, and Worcester at 6 30 a. m. Special contracts will be made for cargoes, or large quanties of freight, on application to the superintendent.

☞ *Fares are Less when paid for Tickets than when paid in the Cars.* ☜
32 1y J W. STOWELL, Sup't

LONG ISLAND RAILROAD COMPANY. Summer Arrangement. On and after Monday May 1st, trains will run as follows, except Sundays:

Leave—Brooklyn at 9 1-2 a.m. for Farmingdale, 1 1-2 p.m. for Greenport, at 4 p.m. for Farmingdale.

Leave Farmingdale at 7 a.m for Brooklyn, 12 m. do., at 3 1-4 do. do.

Leave Greenport at 8 1-2 a.m. for Brooklyn.

Leave Jamaica at 8 a.m. for Brooklyn, at 1 p.m. do., at 4½ p.m do.

On Saturdays, a train will leave Brooklyn for Yaphank, at 4 p.m. Leave Yaphank, on Mondays for Brooklyn at 5 1-2 a.m.

On and after May 15th, and until September 1st, 1847, a train will leave Jamaica at 7 a.m. for Brooklyn—leave Brooklyn at 6 p.m. for Jamaica, and will land and receive passengers at any place between Brooklyn and Jamaica.

On Sundays—leave Brooklyn at 8 1-2 a.m. for Farmingdale; leave Farmingdale at 4 p. m. for Brooklyn.

Freight Trains—leave Brooklyn at 10 a.m. for Greenport; leave Greenport at 12 m. for Brooklyn.

Baggage crates will be in readiness at the foot of Whitehall street, to receive baggage for the several trains, 30 minutes before the hour of starting from the Brooklyn side.

The steamer "Statesman," Captain Nash, leaves Greenport for Sag Harbor on the arrival of the Accommodation train from Brooklyn.
15tf DAVID S. IVES Sup't.

NEW YORK AND PHILADELPHIA RAILroad line—direct. Via Newark, New Brunswick, Princeton, Trenton, and Bristol. (Through in six hours.) Leaving New York daily from the foot of Liberty street.

Morning line.....9 o'clock a.m.
Mail pilot line.....4½ " p.m.

The lines proceed direct to Bristol without change of cars, and thence by the new steamer, "John Stevens," to Philadelphia.

FARE BETWEEN NEW YORK & PHILA.
First class cars.....$4 00
Second class cars..... 3 00

Passengers will procure their *Tickets* at the office foot of Liberty st., where a commodious steamboat will be in readiness with Baggage-crates on board.

Fifty pounds of baggage will be allowed to each passenger in this line, and passengers are expressly prohibited from taking anything as baggage but their wearing apparel, which will be at the risk of the owner.

Philadelphia Baggage-crates are conveyed from city to city, without being opened by the way. Each train is provided with a car, in which are apartments and dressing rooms expressly for ladies' use

Returning, the lines leave Philadelphia from the foot of Walnut st. at 9 a.m, and 4 1-2 p.m.

The lines for Baltimore leave Philadelphia daily except Sundays, at 8 a.m., 3½ and 10 p.m., and Sundays only at 10 p.m.—being a continuation of the line from New York. 25tf

WESTERN RAILROAD.—ON AND AFter Monday, April 5, 1847, the passenger trains will leave daily, Sundays excepted, as follows:

Boston at 8 a. m. and 4 p. m. for Albany.

Albany at 7 1-4 a. m. and 5 p. m. for Boston.

Springfield at 8 1-2 a. m. and 1 p. m. for Albany

Springfield at 8 1-2 a. m. and 1 1-2 and 3 p. m. (or on arrival of the train from New York) for Boston.

Day line to New York, via Springfield.—The steamboat train leaves Boston at 6 a. m., and arrives in New York at 7 p. m., by the steamboats Traveller, New York, or Champion. Returning, leaves New York at 6 1-4 a. m., and arrives in Boston at 7 p. m.

Night line to New York.—Leaves Boston at 4 p. m., and arrives in New York at 5 a. m.

Albany and Troy.—Leave Boston at 8 a. m., Springfield at 1 p. m., and arrive in Albany at 6 p. m.; or, leave Boston at 4 p.m., Springfield next morning at 8 1-2, and arrive in Albany at 1 1-2 p.m.

The Troy trains connect at Greenbush.

The trains for Buffalo leave at 7½ a.m. and 7 p.m.

For Northampton, Greenfield, etc.—The trains of the Connecticut River Railroad leave Springfield at 8 1-4 a.m., 1 and 3 p.m., and passengers proceed directly on to Brattleboro', Windsor, Bellows Falls, Walpole, Hanover, Haverhill, etc.

For Hartford.—The trains leave Springfield on the arrival of the trains from Boston.

The trains of Pittsfield and North Adams Railroad leave Pittsfield on the arrival of the trains from Boston.

N. B.—No responsibility assumed for any baggage by the passenger trains, except for wearing apparel not exceeding the value of fifty dollars, unless by special agreement.

JAMES BARNES, Sup't and Eng'r.
C. A. SEAD, Agent, 27 State street, Boston.

GREAT SOUTHERN MAIL LINE! VIA Washington city, Richmond, Petersburg, Weldon and Charleston, S. C., direct to New Orleans. The only Line which carries the Great Southern Mail, and Twenty-four Hours in advance of Bay Line, leaving Baltimore same day.

Passengers leaving New York at 4½ P.M., Philadelphia at 10 P.M., and Baltimore at 6½ A.M., proceed without delay at any point, by this line, reaching Richmond in *eleven*, Petersburg in *thirteen and a half hours*, and Charleston, S. C., in *two days* from Baltimore.

Fare from Baltimore to Charleston.....$21 00
" " " Richmond..... 6 60

For Tickets, or further information, apply at the *Southern Ticket Office*, adjoining the *Washington Railroad Office*, Pratt street, Baltimore, to
1y14 STOCTON & FALLS, Agents.

NEW YORK AND ERIE RAILROAD LINE SUMMER ARRANGEMENT. For passengers, twice each way daily, (except Sunday,) leave New York from the foot of Duane St. at 7 o'clock, A. M. and at 4 o'clock, P. M. by steamboat, for Piermont, thence by cars to Ramapo, Monroe, Chester, Goshen, Middletown, Otisville, and the intermediate stations.

The return trains for New York will leave Otisville at 6 30, A. M. and 4 15, P. M.; Middletown at 7 A. M. and 4 40, P. M.; Goshen at 7 22, A. M. and 5 3, P. M.; Chester at 7 35, A. M. and 5 18, P. M.

Fare between New York and Otisville, $1 50; way-fare in proportion.

FOR MILK—Leave Otisville at 5½ o'clock, morning and evening.

FOR FREIGHT—The barges "Samuel Marsh and "Henry Suydam, Jr." will leave New York (from the foot of Duane St.) at 5 o'clock, P. M. daily (except Sundays.)

No freight will be received in New York after 5 o'clock, P. M.

Freight for New York will be taken by the trains leaving Otisville at 10½ o'clock, A. M.; Middletown at 11½, A. M.; Goshen at 12½, P. M.; Chester at 1 o'clock, P. M., etc., etc.

For farther particulars, apply to J. F. CLARKSON, Agent, corner of Duane and West Sts., New York, or to S. S. POST, Superintendent Transportation, Piermont.

2tf H. C. SEYMOUR, Sup't.

LITTLE MIAMI RAILROAD COMPANY. Fall and Winter Arrangement, 1847. On and after Monday, September 20th, until further notice, a Passenger train will run as follows:

Leave Cincinnati daily at 9 A. M., for Milford, Foster's Crossing, Deerfield, Morrow, Fort Ancient, Freeport, Waynesville, Spring Valley, Xenia, Yellow Springs, and Springfield. Returning, will leave Springfield at 4½ a.m. Upward train arrives at Springfield at 2½ p.m. Downward train arrives at Cincinnati at 10½ a.m.

Freight trains will run each way daily.

Messrs. Neil, Moore & Co. are running the following stage lines in connection with the road:

A daily line from Xenia to Columbus and Wheeling, carrying the great Eastern mail.

Daily lines from Springfield to Columbus, Zanesville and Wheeling. Also to Urbana and Bellefontaine.

A line of Hacks runs daily in connection with the train between Deerfield and Lebanon.

Passengers leaving for New York and Boston, arrive at Sandusky city via Urbana, Bellefontaine & the Mad River and Lake Erie railroad, in 27 hours, including several hours' sleep at Bellefontaine. To the same point via Columbus, Delaware, Mansfield and the Mansfield and Sandusky city railroad, is 32 hours. Distance from Cincinnati to Springfield by railroad.....84 miles.

From Springfield to Bellefontaine by stage, over a good Summer road.....32 "

From Bellefontaine to Sandusky city by railroad.....102 "

FARE—From Cincinnati to Lebanon....$1 00
" " " Xenia..... 1 50
" " " Springfield.. 2 00
" " " Columbus... 4 00
" " " Sandusky city 7 00

The Passenger trains runs in connection with Strader & Gorman's line of Mail Packets to Louisville.

Tickets can be procured at the Broadway Hotel, Dennison House, or at the Depot of the Company on East Front street.

Further information and through tickets for the Stage lines, may be procured at P. Campbell, Agent on Front street, near Broadway.

The company will not be responsible for baggage beyond 50 dollars in value, unless the same is returned to the conductor or agent, and freight paid at of a passage for every $500 in value over that amount.

47tf W. H. CLEMENT, *Sup't.*

BALTIMORE AND SUSQUEHANNA Railroad.—Reduction of Fare. Morning and Afternoon Trains between Baltimore and York.—The Passenger trains run daily, except Sunday, as follows:

Leaves Baltimore at	9 a.m. and	3½ p.m.
Arrives at	9 a.m. and	6½ p.m.
Leaves York at	5 a.m. and	3 p.m.
Arrives at	12½ p.m. and	8 p.m.
Leaves York for Columbia at	1½ p.m. and	8 a.m.
Leaves Columbia for York at	8 a.m. and	2 p.m.

FARE.

Fare to York.....$1 50
" Wrightsville..... 2 00
" Columbia..... 2 12½

Way points in proportion.

PITTSBURG, GETTYSBURG AND HARRISBURG.

Through tickets to Pittsburg via stage to Harrisburg..... $9
Or via Lancaster by railroad..... 10
Through tickets to Harrisburg or Gettysburg.. 3
In connection with the afternoon train at 3½ o'clock, a horse car is run to Green Spring and Owing's Mill, arriving at the Mills at.....5½ p.m.
Returning, leaves Owing's Mills at.....7 a.m.

D. C. H. BORDLEY, *Sup't.*

31 1y Ticket Office, 63 North st.

LEXINGTON AND OHIO RAILROAD. Trains leave Lexington for Frankfort daily, at 5 o'clock a.m., and 2 p.m. Trains leave Frankfort for Lexington daily, at 8 o'clock a.m. and 2 p.m. Distance, 28 miles. Fare $1·25.

On Sunday but one train, 5 o'clock a.m. from Lexington, and 2 o'clock p.m. from Frankfort.

The winter arrangement (after 15th September to 15th March) is 6 o'clock a.m. from Lexington, and ma. 9. from Frankfort, other hours as above. 351y

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CENTRAL AND MACON AND WESTern Railroads, Ga.—These Roads with the Western and Atlantic Railroad of the State of Georgia, form a continuous line from Savannah to Oothcaloga, Ga., of 371 miles, viz:

	Miles.
Savannah to Macon—Central Railroad	190
Macon to Atlanta—Macon and Western	101
Atlanta to Oothcaloga—Western and Atlaniic	80

Goods will be carried from Savannah to Atlanta and Oothcaloga, at the following rates, viz:

	To Atlanta.	To Oothcaloga.
On Weight Goods—Sugar, Coffee, Liquor, Bagging, Rope, Butter, Cheese, Tobacco, Leather, Hides, Cotton Yarns, Copper, Tin, Bar & Sheet Iron, Hollow Ware & Castings	$0 50	$0 75
Flour, Rice, Bacon in Casks or boxes, Pork, Beef, Fish, Lard, Tallow, Beeswax, Mill Gearing, Pig Iron and Grind Stones	0 50	0 62½
On Measurement Goods—Boxes of Hats, Bonnets and Furniture, per cubic foot	0 20	0 26
Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs and Confectionary, per cubic foot	0 20	pr. 100 lbs. 35
Crockery, per cubic foot	0 15	" " 35
Molasses and Oil, per hhd., (smaller casks in proportion).	9 00	12 50
Ploughs, (large,) Cultivators, Corn Shellers, and Straw Cutters, each	1 25	1 50
Ploughs, (small,) and Wheelbarrows	0 80	1 05
Salt, per Liverpool Sack	0 70	0 95

Passage—Savannah to Atlanta, $10; Children, under 12 years of age, half price, Savannah to Macon, $7,

☞ Goods consigned to the subscriber will be forwarded free of Commissions.

☞ Freight may be paid at Savannah, Atlanta or Oothcaloga.

F. WINTER, *Forwarding Agent, C. R. R.*
Savannah, Aug. 15th, 1846. 1y34

BALTIMORE AND OHIO RAILROAD. MAIN STEM. The Train carrying the Great Western Mail leaves Baltimore every morning at 7½ and Cumberland at 8 o'clock, passing Ellicott's Mills, Frederick, Harpers Ferry, Martinsburgh and Hancock, connecting daily each way with—the Washington Trains at the Relay House seven miles from Baltimore, with the Winchester Trains at Harpers Ferry — with the various railroad and steamboat lines between Baltimore and Philadelphia and with the lines of Post Coaches between Cumberland and Wheeling and the fine Steamboats on the Monongahela Slack Water between Brownsville and Pittsburgh. Time of arrival at both Cumberland and Baltimore 5½ P. M. Fare between those points $7, and 4 cents per mile for less distances. Fare through to Wheeling $11 and time about 36 hours, to Pittsburgh $10, and time about 32 hours. Through tickets from Philadelphia to Wheeling $13, to Pittsburgh $12. Extra train daily except Sundays from Baltimore to Frederick at 4 P. M., and from Frederick to Baltimore at 8 A. M.

WASHINGTON BRANCH.

Daily trains at 9 A. M. and 5 P. M. and 12 at night from Baltimore and at 6 A. M. and 5½ P. M. from Washington, connecting daily with the lines North, South and West, at Baltimore, Washington and the Relay house. Fare $1 60 through between Baltimore and Washington, in either direction, 4 cents per mile for intermediate distances. s13y1

CENTRAL RAILROAD—FROM SAVANnah to Macon. Distance 190 miles. This Road is open for the transportation of Passengers and Freight. Rates of Passage, $8 00. Freight—

On weight goods generally... 50 cts. per hundred.
On measurement goods..... 13 cts. per cubic ft.
On brls. wet (except molasses and oil).....$1 50 per barrel.
On brls. dry (except lime)... 80 cts. per barrel.
On iron in pigs or bars, castings for mills, and unboxed machinery..... 40 cts. per hundred.
On hhds. and pipes of liquor, not over 120 gallons.....$5 00 per hhd.
On molasses and oil.....$6 00 per hhd.

Goods addressed to F. WINTER, Agent, forwarded free of commission. THOMAS PURSE,
y40 Gen'l. Sup't. Transportation.

SOUTH CAROLINA RAILROAD.—A Passenger Train runs daily from Charleston, on the arrival of the boats from Wilmington, N. C., in connection with trains on the Georgia, and Western and Atlantic Railroads—and by stage lines and steamers connects with the Montgomery and West Point, and the Tuscumbia Railroad in N. Alabama.

Fare through from Charleston to Montgomery daily.....$26 50
Fare through from Charleston to Huntsville, Decatur and Tuscumbia..... 22 00

The South Carolina Railroad Co. engage to receive merchandize consigned to their order, and to forward the same to any point on their road; and to the different stations on the Georgia and Western and Atlantic railroad; and to Montgomery, Ala., by the West Point and Montgomery Railroad.

r25 JOHN KING, Jr, *Agent.*

THE WESTERN AND ATLANTIC Railroad.—This Road is now in operation to Oothcaloga, a distance of 80 miles, and connects daily (Sundays excepted) with the Georgia Railroad.

From Kingston, on this road, there is a tri-weekly line of stages, which leave on the arrival of the cars on Tuesday, Thursday and Saturday, for Warrenton, Huntsville, Decatur and Tuscumbia, Alabama, and Memphis, Tennessee.

On the same days, the stages leave Oothcaloga for Chattanooga, Jasper, Murfreesborough, Knoxville and Nashville, Tennessee.

This is the most expeditious route from the east to any of these places.

CHAS. F. M. GARNETT,
Chief Engineer.
Atlanta, Georgia, April 16th, 1846. 1y1

AMERICAN RAILROAD JOURNAL.
OFFICE AT THE FRANKLIN HOUSE,
105 Chestnut Street,
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This is the only periodical having a general circulation throughout the Union, in which all matters connected with public works can be brought to the notice of all persons in any way interested in these undertakings. Hence it offers peculiar advantages for advertising times of departure, rates of fare and freight, improvements in machinery, materials, as iron, timber, stone, cement, etc. It is also the best medium for advertising contracts, and placing the merits of new undertakings fairly before the public.

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☞ LETTERS and COMMUNICATIONS for this Journal may be directed to the *Editor,*

D. K. MINOR.